THE OIL WEEKLY

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The Oil Man's Calendar

DEC.	
4– 7	**American Society of Mechanical Engineers, Philadelphia.**
4– 9	**Exposition of Chemical Industries, Grand Central Palace, New York.**
7– 8	**Mid-Continent Oil & Gas Association, Standing Tax Committees, Rice Hotel, Houston, Texas.**
11	**West Central Texas Oil & Gas Association, Abilene, Texas.**
14–15	**Petroleum Electric Power Association, Texas State Hotel, Houston, Texas.**
FEB. 12–15	**American Institute of Mining & Metallurgical Engineers, New York.**
APR. 10–12	**American Association of Petroleum Geologists, Chicago.**
11–12	**American Petroleum Institute, Eastern District, Division of Production, Columbus, Ohio.**
MAY 18-25	**International Petroleum Exposition & Congress, Tulsa.**

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OIL SHOW

WAR INCREASES SHOW DEMANDS

The European War has increased the demands for Petroleum Products and greatly stimulated interest in the 1940 International Petroleum Exposition. The methods and equipment for greater recovery of oil, better products, greater operating efficiency and lower costs will be featured at the Exposition. For information write Wm. B. Way, Gen. Mgr., Tulsa, Okla.

TULSA
May 18-25
1940

The World's Fair of the Oil Industry

THE OIL WEEKLY

NOVEMBER 20, 1939

VOLUME 95 NUMBER 11

The Week's Panorama

Too Much Gasoline . . . . . .

Gasoline stocks are becoming increasingly excessive. They have been expanding contra-seasonally since the beginning of October, and now are 8.5 percent larger than at this time last year. That gain is not justified by demand, which has been running only about 5 percent above last year's curve. In fact, despite better demand, the industry could be operating satisfactorily with even smaller stocks than those of a year ago, the inventory then having been seriously burdensome. Present stocks of over 73,000,000 barrels compare with 67,500,000 held a year ago, and are regarded as 10,000,000 barrels or more in excess of operating requirements.

Venezuelan Pact . . . . . .

Not only oil producers but also their competitors, the coal miners, are protesting the reductions in excise taxes on crude and fuel oils imported from Venezuela, under the recently announced trade agreement with that country. Both groups see in the agreement a loss of business, and the coal miners say railroads also will lose, because of hauling less coal. . . . The state department obtained concessions for United States business in return for the lower oil import taxes, and it justified the pact not only as a trade stimulant but also as a measure for conserving United States petroleum resources.

Federal Control Aided . . . .

The situations in California and Illinois constitute probably the strongest weapon in the hands of advocates of the Cole bill for federal oil control. Secretary Ickes and other witnesses at the Cole committee hearings in Washington declared that the need for federal regulation was demonstrated in California's defeat of a proration bill and in the refusal of Illinois to adopt such a measure.

Cole Committee . . . . . .

Scheduled December 12 at New Orleans is the resumption of hearings by the Cole committee. State authorities then and there will be afforded opportunity to answer assertions of Secretary Ickes that state control has not done a "complete job." In advance of the hearing, the committee of five will inspect oil fields in Illinois and Oklahoma.

Oil Export Ban . . . . . .

Secretary Ickes told the Cole committee that "personally and not officially," he would endorse restrictions on exports of oils from the United States, so as to conserve the nation's reserves. Previously, the question of the advisability of curtailing exports, for national defense, had been raised by a member of the Cole committee, in quizzing Rear Admiral H. A. Stuart, director of the naval petroleum reserves; and the admiral, also speaking "personally and not officially," likewise had approved an embargo on oil exports.

New "Madison" Trial . . . .

The stage now is set for another trial similar to that at Madison, indictments having been returned by a federal grand jury at Los Angeles against 40 oil companies for alleged fixing of gasoline prices in California.

Madison Aftermath . . . . . .

Expected within a month is the Supreme Court's decision on whether or not Federal District Judge Patrick Stone acted correctly in dismissing indictments against 11 defendants in the Madison case after they had been convicted by a jury. The judge acted on motions for a favorable verdict made by the defendants before the case went to the jury, and his decision was sustained by federal circuit court, but the government appealed to the Supreme Court.

Oil Equipment Exports . . . .

Exports of mining, well, and pumping equipment held up relatively well in October, according to Department of Commerce figures, which showed only a slight decrease from September. Although the European war has interfered with shipments across the Atlantic, a comparatively large proportion of oil industry equipment exports go to South American countries. So far this year, oil equipment exports have been running about the same as those in 1938.

Tax Changes Wanted . . . . .

About 40 changes in the present revenue laws have been proposed to the Treasury Department by the United States Chamber of Commerce, the department having requested suggestions in its study of tax deterrents. The C. of C. regarded the revenue act of 1939 as definitely instrumental in the present upturn of business and employment and predicted that recovery would be accelerated by further changes in the federal tax structure. The organization declares that healthy business is the only dependable, permanent source of substantial revenue, and contends that "the primary consideration for a sound revenue system is the encouragement of private industry, private investment, and private employment."

Industry Denounces Federal Control

American Petroleum Institute protests by resolution Cole bill and Venezuelan trade treaty; Pogue says economic and social aspects all-important now.

By WARREN L. BAKER, Editor

PROBLEMS of industry-government relations, industry-public relations and industry-employee relations and oil's present transitional stage were stressed at the Twentieth Annual Meeting of the American Petroleum Institute in Chicago last week, the largest gathering of oil men in history.

Highlight of the general and public relations sessions, which brought forth the above subjects, was the presentation of both sides of the question of federal control.

Regulation of oil production by state conservation laws is bound to fail, proponents of federal control believe, and the federal government must step in to legislate in the "no man's land" between the present state and federal legislation, Representative William P. Cole, Jr., of Maryland stated in presenting an analysis of his bill proposing federal regulation of oil production under direction of a commissioner to be appointed by the President of the United States. The congressman, however, made it clear he was not expressing any personal opinions, but merely ideas existing in governmental circles.

Denounces Federal Control

He was followed on the speaker's platform by Governor Leon C. Phillips of Oklahoma, who denounced federal encroachment in the field of state regulations and denied the necessity of a greater degree of control than that now exercised by the state conservation authorities. Enactment of a federal law to control the production of oil, Governor Phillips declared, would imperil democracy and might easily be turned to despotic ends. Furthermore, he held that federal control would be injurious to many branches of the industry.

W. R. Boyd, Jr., Institute executive vice president, another general session speaker, said the recent hearings conducted by the Temporary National Economic Committee had revealed the petroleum industry as a typical American enterprise and declared that "the industry is as near all right as any industry can be in this somewhat imperfect world."

"In Transitional Stage"

Few recognize that the industry is in a transitional stage, Dr. Joseph E. Pogue, petroleum economist and vice president of Chase National Bank, New York, told the convention attenders. He explained that the period marked by engineering and physical problems is giving way to an era in which the economic and social phases are assuming dominance. This passage from youth to maturity was said to be creating issues which complicate the responsibilities of management and which call for development of new methods and approaches, including the cultivation of a more pervasive sense of social values and adjustment of the frontiers of competition to the requirements of economics and the dictates of social welfare. Dr. Pogue recommended the industry accelerate the transition from proration guided by economic criteria, such as market demand, to proration grounded in engineering standards, such as optimum rates, thus furthering the objectives of conservation and minimizing the delegation of economic power to regulatory bodies.

The American Petroleum Institute is opposed to the Cole bill, which provides for federal regulation of crude production, and also to the recently announced trade agreement with Venezuela, which gave the latter country a material reduction in import taxes on petroleum. Resolutions setting forth protests to them were adopted by the board of directors at its Thursday morning session.

The resolution denouncing the Cole control measure, introduced into Congress last June, declared that the passage of this bill, or legislation of a similar purport, would "not be in the best interest of either the nation, the states, the consuming public, or the industry." The board asked that Congress refuse to enact the law. At the same time the resolution made it clear that the Institute favored the enactment of conservaion laws in all the important oil producing states in the nation.

It was the opinion of the board that the Cole bill would result in transferring to a subordinate bureau of the Department of Interior, control in "the minutest degree of the production and transportation activities of the industry, and would also indirectly affect the refining and marketing activities of the industry, thus duplicating many existing state regulatory agencies and creating conflicts of authority and jurisdiction, obstructing rather than aiding the cause of conservation; and furthermore, such a bill would greatly interfere with, if not destroy, the petroleum industry as an integral part of the American system of free enterprise."

Venezuelan Treaty Protested

The board's resolution protesting that part of the recently announced trade agreement with Venezuela which proposes to interfere with laws relating to petroleum imports, requested that the president not promulgate such action, and "that in the consideration of trade agreements in the future, petroleum and its products should not be included."

The resolution further requested Congress to take "such steps as may be necessary to prevent the importation into the United States, on any basis, of oil produced in Mexico until the differences with Mexico over the expropriation of

Mid-Year to Fort Worth

Fort Worth was selected for the Mid-Year meeting of the American Petroleum Institute by the Board of Directors. The meeting will be held May 27-31, 1940, with exact

And Stresses Public Relation Problems

dates to be announced later. The annual meeting will be held in the Stevens Hotel at Chicago, and the week of November 11-15 has been selected tentatively.

The board of directors also accepted a request of the Independent Petroleum Association for appointment of a conference committee to discuss the advisability of segregating the earnings of integrated companies. The Institute committee follows: Chairman, J. Edgar Pew, Sun Oil Company, Philadelphia; W. S. Farish, Standard Oil Company (New Jersey); W. S. S. Rodgers, The Texas Company; J. Frank Drake, Gulf Oil Corporation; and E. S. Seubert, Standard Oil Company (Indiana). This committee will confer with the IPA group composed of: Chairman Charles F. Roeser, Paul G. Blazer, John M. Lovejoy, B. L. Majewski, and Walter A. Jones.

A resolution also was adopted calling for a census of producing oil wells in the United States, and a memoriam on the death of J. W. Van Dyke, chairman of the board, The Atlantic Refining Company, Philadelphia.

Committee to discuss advisability segregating integrated company earnings; Phillips declares Federal control but a step toward Communism.

Cole on Federal Control

The sponsor of the bill designed to provide federal production control, Representative William P. Cole, Jr., of Maryland, who is also chairman of the congressional committee which last week began hearings on the measure, told the general session that the first week's testimony indicated to many the inability of all the states to meet the problem of preventing avoidable waste in oil production. [Only government men with the Department of Interior, Army and Navy appeared as witnesses at the hearings; oil industry representatives being scheduled to appear later.]

"There are those who believe that state regulation, after a reasonable period of trial, has failed in the matter of prevention of avoidable waste to the degree the nation should expect and is not likely to prove effective in the future," Cole declared. "But whether state regulation has failed to such an extent that the enactment of this legislation is necessary is a question on which I express no opinion. Perhaps our committee will be able to form an opinion."

The Supreme Court would consider evidence indicating inability of the states to control as favoring the constitutionality of the bill, Cole continued. He traced other constitutional questions involved, quoting pertinent decisions which he said supported the bill's constitutionality. He asserted that any possible unconstitutionality because the original bill did not specify the wasteful methods and practices it proposed to prohibit, would be considered by the committee.

States Rights Recognized

Right of the states to control oil production has been recognized by the committee, Cole admitted, but added: "We have felt that the problem is not too big for the states if they sincerely want to solve it; at the same time, the problem is not one which will tolerate abandonment or trifling by the states."

He quoted California and Illinois as states where many difficulties are attending attempts at state regulation, and cited the recent discovery of oil in Nebraska where, he asserted, "the whole story may repeat itself because the state has not passed regulatory measures and is not likely to do so once the race of competitive drilling gets under way."

Cole repeated statements by President Roosevelt and Secretary of the Interior Ickes supporting the bill, and stated that the president told him again recently that "his interest in the prevention of avoidable waste in the production of oil and gas is stronger than ever today."

Although he devoted his speech to a defense of the "proponents" of the bill he sponsored, Cole asserted his intention of keeping the opinions of himself and of his committee completely unbiased until representatives of the petroleum industry and of the states have had an opportunity to study the statistical testimony presented last week and have stated their side of the case. Cole said he expected that testimony would not be completed until after Congress convenes in January, 1940.

Against Federal Control

Calling attention to a difference between the apparent purpose of the currently-proposed Cole Bill for regulation of production by a federal commissioner and the despotic ends to which the bill might easily be turned, Governor Leon C. Phillips of Oklahoma recommended that the Institute go on record against the bill during its twentieth annual meeting. He compared the proposed oil-control bill with the act which created the National Labor Relations Board, and asserted that such dictatorial powers as are enjoyed by NLRB commissioners would be granted to a single oil comissioner, with similar irreparable injustice probably resulting.

State conservation laws, under their own inherent police power, already are doing all that the federal government could do to prevent avoidable waste of petroleum, the governor declared.

"The states, with the cooperation of the oil industry, are getting the job done," he said. "Reserves of available oil in sight have increased constantly. Oil is being produced under sound engineering practices to insure the largest recovery for the use of civilization. Research and discovery have made available to the public many by-products. An instance of this is the production of butane from natural gas, making a liquefied product which is coming into wide use, just one of many examples of the foresight and ingenuity of those in the oil business tending to conserve this natural

resource. The nation need have no fear of a shortage of oil or gas in any emergency. It is not necessary to have government control in order to assure an adequate supply."

Offers Nothing New

The Cole Bill was said merely to incorporate principles of conservation discovered by the oil producers themselves. The bill by its terms unqualifiedly endorses the conservation methods and practices already invoked by the oil-producing states in their own conservation laws, the governor said, but in addition most of the state laws are superior to the proposed federal bill, and are fairer and more equitable in that they take cognizance of the correlative rights of operators and of the different fields.

He warned that such federal legislation inevitably meant duplication and recurring clashes between state and federal officials, with the oil man caught between.

"A real conflict of authority would be inevitable unless the Cole Bill should be amended so as to deprive the states of their police power, and the Supreme Court should sustain such a law," he stated. "In that event, the states would lose all jurisdiction. That would be a complete surrender of state sovereignty.

"I firmly believe that such legislation as the Cole Bill imperils democracy as we know it," Governor Phillips asserted. "To turn over the oil industry to federal control and regulation under this bill is another step in the direction of collectivism, and collectivism is the bone and sinew of Communism. This march toward government control of industry, labor and our free institutions, must be stopped. What we need is more business in government and less government in business.

Pogue Analyzes Ills

"Hasty analysis and sloganized thinking" have led to incorrect understandings of the forces at work and even to the incursion of unwise restrictions upon the progress of the petroleum industry, in the opinion of Dr. Joseph E. Pogue.

"So many individuals and groups have diagnosed the ills of the petroleum industry, with the outpouring of such a stream of varied interpretations that the real issues are beclouded and distorted," Dr. Pogue explained.

"The tendency," he said, "has been to jump to simple but untenable conclusions, not only because of the technical intricacies of the long series of operations from well to consumer, but also because existing difficulties are more readily interpreted as structural failures than understood in their true light as results of the complexities and rapid growth of the industry."

He declared that the industry is in a transitional state in which engineering and physical problems are giving way to the dominance of economic and social phases. Pogue recommended that the industry accelerate the change from proration guided by economic criteria, such as market demand, to production regulation based on engineering standards.

"This shift would free the system from its most unsettling and complaint - provoking aspects," he stated. "Market-demand quotas are difficult to administer, because the regulatory bodies are invested with the responsibility for making economic decisions affecting conflicting interests. This delegation of economic authority to the states constitutes a standing invitation to the extension of controls to other phases of the industry, and even to eventual centralization in the federal government. Therefore, the drift toward further transfers of economic power from the hands of the industry to those of the government can only be reversed by a transfer of emphasis from economic to engineering criteria.

One Solution

The agency for the gradual return to a freer economy is available in the optimum-rate basis for proration. This concept offers a practical engineering standard for limiting production more effectively for conservation objectives, while at the same time creating an adequate degree of derived stability and minimizing the arbitrary restraints on production."

"Investigations of the industry," Pogue declared, "render the industry a great service if accompanied by self - examination and studied with a view of discovering the significance of the determinations. The striking thing about all recent findings is the virtual absence of criticisms directed at the industry as a whole, and the recurrence of protests against internal competitive practices."

Asserting that the industry itself is in a preferred position to take remedial action on well-grounded objections, he warned that such panaceas as government intervention or industrial disintegration are of a severity out of proportion to the gravity of issues which really are incidental maladjustments in a rapidly-changing industry.

Taxation a Business Threat

"There is no prospect of a blackout of freedom in America," Paul G. Hoffman, president of The Studebaker Corporation, South Bend, Ind., said in addressing the general session Wednesday.

"There is, however, danger of a fadeout," Hoffman warned, "as a result of certain pressures which threaten free enterprise. The outward manifestation of the hazard to free enterprise is the excessive and constantly mounting burden of federal, state, and local taxation."

Any government will topple if its citizens lean too heavily upon it, the motor car executive said. He urged a fight to the death against legislation which has as its objective taking competition out of the competitive system, "for in free competition and free enterprise lies the force which will operate inexorably to bring down costs and expand markets."

Public Relations

Improvement of public relations was stressed strongly by the Institute's program, which included one entire session devoted to the subject and a relations speaker at one of the general sessions.

No industry is more generally helpful to the nation than the petroleum industry, and none is more deserving of public commendation and support, oil men were told at the general session Thursday. The speaker was Victor H. Scales, director of the Institute's Department of Public Relations.

No other industry, Scales said, so continuously and so completely has satisfied every public demand. Whether the petroleum industry receives the treatment it merits and whether it claims the rewards it has earned, he added, depends upon how it creates and perpetuates thorough understanding of its operations, its contributions and its policies in the minds of its many publics.

Scales reported on the progress made toward that end in the Institute's public relations program and outlined the methods adopted. Because it is an accepted principle that public relations activities should begin at home, much of the

program to date has dealt with the petroleum industry's own employes, executives and associates.

"It is obvious that when better understanding, impression and appreciation of this industry are created among its own people," Scales declared, "we can expect a beneficial influence upon public opinion to develop almost automatically."

No other product has unloosed such a tide of improvement as has the development of petroleum lubricants, according to W. D. Humphrey, of The Ohio Oil Company, Findlay, Ohio. He traced the importance of lubricants and other derivatives of "Helpful Petroleum" before a group session on public relations.

Use of individual company advertising to tell an industry public relations story to the public does not mean that the company's competitive advertising should be stopped, H. K. Boice, of Benton & Bowles, Inc., New York, declared at the session. Too-competitive advertising, however, he warned, with superlative product claims, inclines the public to say "baloney," and "to the public anyone who has anything to do with the oil industry is a representative of the entire industry; every attitude the public has toward any component part of the industry is an attitude toward the entire industry."

Various steps in the development of improved employe relations, and a subsequent increase in their effectiveness as good-will ambassadors of the industry, were outlined by H. H. Anderson, Shell Oil Company, St. Louis, Missouri. Adoption of a fair management attitude, development of a sound employe-relations program, complete explanation of the program to all employes, and correct training of a supervisory staff were among the suggested points in a program to make the industry's employes "Petroleum's Good-Will Ambassadors."

Byles Again Heads Institute

George Hill continues vice president in charge of production; Boyd re-elected executive vice president; 95 are chosen for API board.

AXTELL J. BYLES, president, and all other officers of the American Petroleum Institute were re-elected. Byles has been president of the trade organization since 1933.

George A. Hill, Jr., president of Houston Oil Company of Texas, Houston, continues as vice president in charge of production; J. Howard Pew, president of Sun Oil Company, Philadelphia, is vice president in charge of refining; and E. V. Weber, Eureka Oil Company, Cincinnati, remains as vice president of marketing.

W. R. Boyd, Jr., New York, was reelected executive vice president.

O. D. Donnell, The Ohio Oil Company, was renamed treasurer; Lacey Walker, secretary and assistant treasurer; and J. S. Cooke, assistant secretary.

The new executive committee consists of the following members, in addition to the above mentioned officers who also are members: W. H. Berg, Standard Oil Company of California, San Francisco; L. B. Simmons, Rock Island Refining Company, Duncan, Oklahoma; J. A. Brown, Socony-Vacuum Oil Company, New York; J. C. Hunter, Abilene, Texas; Robert H. Colley, The Atlantic Refining Company, Philadelphia; Henry M. Dawes, The Pure Oil Company, Chicago; W. S. Farish, Standard Oil Company (New Jersey), New York; Jake L. Hamon, Cox & Hamon, Inc., Dallas; W. F. Humphrey, Tide Water Associated Oil Company, San Francisco; W. A. Jones, Cities Service Oil Company, New York; G. A. Leovy, Gulf Oil Corporation, Pittsburgh; B. L. Majewski, Deep Rock Oil Corporation, Chicago; Frank Phillips, Phillips Petroleum Company, Bartlesville, Oklahoma; Charles F. Roeser, Roeser & Pendleton, Incorporated, Fort Worth; W. S. S. Rodgers, The Texas Company, New York; E. G. Seubert, Standard Oil Company of Indiana, Chicago; Harry F. Sinclair, Consolidated Oil Corporation, New York; W. G. Skelly, Skelly Oil Company, Tulsa; and E. Van Der Woude, Shell Union Oil Corporation, New York.

95 Directors Elected

Members of the Institute elected 95 members to the trade association's 110-member board of directors, the nominations being made by the board of councillors and the members voting at the afternoon general session, Wednesday afternoon. The board of directors itself elected 15 additional members.

Directors elected by the members, with re-elections indicated by astrisks, follow:

Production Group, Pacific Coast: L. L. Aubert, Bankline Oil Company, Los Angeles; T. A. O'Donnell,* Los Angeles; and W. M. Keck, Superior Oil Company, Los Angeles, two years; Dana Hogan,* Hogan Petroleum Company, Los Angeles; R. A. Broomfield,* Barnsdall Oil Company, Los Angeles; L. P. St. Clair,* Los Angeles, one-year term.

Rocky Mountain: B. B. Brooks,* Consolidated Royalty Oil Company, Casper, Wyoming.

Central United States: R. L. Wheelock,* Wheelock & Collins, Corsicana, Texas; E. A. Landreth,* Landreth Production Corporation, Fort Worth; H. R. Straight,* Cities Service Oil Company, Bartlesville, Oklahoma; E. H. Moore,* E. H. Moore, Incorporated, Tulsa; H. C. Wiess,* Humble Oil & Refining Company, Houston; J. A. Vickers,* Vickers Petroleum Company, Wichita, Kansas; Jake L. Hamon,* Cox & Hamon, Dallas; Ralph Pryor,* Pryor & Lockhart, Wichita, two years; Amon G. Carter,* Fort Worth, "Star Telegram," Fort Worth; E. DeGolyer,* Dallas; H. L. Hunt,* Hunt Oil Company, Dallas; J. S. Bridwell, Bridwell Oil Company, Wichita Falls, Texas; E. L. Smith,* LaValma Petroleum Company, Dallas; Charles P. McGaha,* Fain & McGaha, Wichita Falls; and E. H. Salrin, Tide Water Associated Oil Company, Houston, one-year terms.

Eastern United States: P. H. Curry,* South Penn Oil Company, Pittsburgh, two years; F. A. Leovy,* Gulf Oil Corporation, Pittsburgh, and O. D. Donnell, The Ohio Oil Company, Findlay, Ohio, one-year terms.

Refining Group, Pacific Coast: W. H. Berg,* Standard Oil Company of California, San Francisco, and S. Belither,* Shell Oil Company, San Francisco, two-year

[*Continued on Page 39*]

Frontiers of Competition in the Petroleum Industry[2]

Interest of the oil industry recently has centered largely on complaints of monopoly and innefficient practices lodged with governmental investigation committees.

We are very happy to publish the accompanying statement, which is an exceptionally clear, concise discussion of a significant transition in oil's economic picture and which refutes the many charges of its critics.

Dr. Pogue's paper was presented at the twentieth annual meeting of the American Petroleum Institute, November 16, 1939.

By JOSEPH E. POGUE[1]

THE petroleum industry is in a transitional stage, the significance of which is not fully recognized by its members and scarcely perceived by its observers and critics. The period marked by engineering and physical problems is giving way to an era in which the economic and social phases are assuming dominance. The passage from youth to maturity is creating issues complicating the responsibilities of management and calling for the development of new methods and approaches. The problems raised by this transformation are projected upon the contemporary scene at a time when the vogue of hasty analysis and sloganized thinking is apt to lead to an incorrect understanding of the forces at work, and even to the incursion of unwise restrictions upon the progress of this great activity.

So many individuals and groups have diagnosed the ills of the petroleum industry, with the outpouring of such a stream of varied interpretations, that the real issues are beclouded and distorted. The tendency has been to jump to simple but untenable conclusions—not only because of the technical intricacies of the long series of operations from well to consumer, but also because existing difficulties are more readily interpreted as structural failures than understood in their true light as results of the complexities and rapid growth of the industry. Static methods of investigation are inadequate to deal with the forces and relationships of economics. The modern technique of dynamic analysis, designed to measure the moving parts and weigh their impact upon the whole system, is necessary to reveal the economic structure and inner workings of the oil industry.

Investigations render the industry a great service if accompanied by self-examination and studied with a view to discovering the significance of the determinations. The striking thing about all recent findings is the virtual absence of criticisms directed at the industry as a whole, and the recurrence of protests against internal competitive practices. No fault is found with the service rendered to the consumer and with the relations of the industry to its personnel. But in respect to procedures within the industry —the handling of economic traffic across departmental frontiers, the administration of the proration-conservation function, and the competitive struggle between contending groups—here interest converges and objections focus. It is important to examine the validity of the criticisms, but it is still more necessary to appreciate that they are widely publicized and often accepted as valid indictments. The crux of the matter is that the industry has permitted these discords to flourish and to become translated into political threats which may have regressive effects upon its progress and its contributions to the economy.

The complaints and grievances voiced against the competitive practices within the petroleum industry may be summarized and grouped under six headings, as follows:

1. Proration is primarily a price-fixing measure, operated under the guise of conservation, which works to the disadvantage of the small operator and the independent refiner.
2. The predominance of large companies in the oil business limits the opportunities for small enterprises.
3. Refinery ownership of pipe lines confers an unfair competitive advantage upon companies so equipped.
4. Integration permits the profits in one division of the business to be used for subsidizing competition in another, to the disadvantage of non-integrated competitors.
5. The field of marketing is beset with competitive practices that unduly restrict the opportunities of independent jobbers and retailers.
6. Pricing policies for both crude oil and products are confusing, and favor the large units.

Effects of Proration

Proration is a legal and administrative device for retarding the rates of flow from individual oil pools for the purpose of conserving oil by maximizing the effectiveness of the reservoir energy. Its orders are imposed by the regulatory bodies of the oil-producing states, under the authority of state conservation laws, and its procedures are in process of coordination by the Interstate Oil Compact Commission. The increased stability arising from proration is a fortunate

[1] The Chase National Bank, New York, N. Y.

[2] For assistance in the preparation of this paper, the writer is indebted to Dr. Norman D. FitzGerald, Department of Petroleum Economics, The Chase National Bank.

circumstance that has raised the conservation concept from an abstraction to a practical measure.

It should be recognized that the only justification for the regulation of crude-oil production rests upon the technical fact that the maximum rate of production is not the most efficient rate. Division of reservoir ownership, which prevails in this country, tends to drive production above the optimum rate, which is the most efficient, towards the maximum rate, which is the most wasteful. Hence regulation of flow must be imposed in the interest of conservation, and the states have developed laws and administrative bodies adequate for this purpose. The undertaking is relatively so new that the procedures have not been fully harmonized with requirements, but great progress is being made toward improved standards of performance.

Proration cannot be administered without a modifying effect upon the frequency and amplitude of price swings, for the reason that retarded rates of flow smooth the cost curve and, consequently, flatten the price curve. In the pursuit of conservation objectives, therefore, the instrumentality of proration cannot avoid dampening the price oscillations and gyrations that used to characterize the flush era. Of this resultant there can be no valid disapproval: the consequences are not only socially desirable in themselves, but also inescapable under impeded rates of flow—the only approach to conservation. The complaints directed against proration, however, are not concerned with its leveling effect upon prices, but center in the questions: are unnatural levels of prices created or threatened; and are price disparities between crude oil and its products brought about?

So long as proration is administered by the states and its controls are not centralized, the system cannot sustain uneconomic prices, because the primary factors that control prices—capital flow, competition between the states, and world conditions of supply and demand—remain active and effective; under such conditions proration simply exerts a smoothing effect within the price range fixed by the fundamentals. Those favoring a more pervasive type of control perhaps visualize the removal of those areas of competition that now debar proration from use as a price-fixing measure.

In its transition period, however, proration has been accompanied by the appearance of lags in the adjustment of crude-oil prices to changes in underlying conditions, which have tended to penalize the non-integrated refiner. Differentials arising from unequal flexibility in the prices of crude oil and its products are probably an unavoidable consequence of the formative stages of a developing structure, but their incidence should lessen as experience broadens. This objectionable type of disparity will eventually disappear as a more flexible pricing mechanism is developed for crude oil in conjunction with a more sensitive adjustment of refinery operations to fluctuations in demands.

The administrative problems of proration involve the establishment of proper rates of production and the preservation of equities as between the common owners in a single reservoir. During the formative period of proration, it has been expedient to utilize market demand as the primary determinant of production rates, with the efficiencies of retarded flow obtained as derivatives of this process. But now that reserves are becoming adequate and sufficient knowledge of reservoir conditions is available, it should be possible to utilize optimum rates as the primary factor, leaving supply and demand to be more freely equated by the competitive processes. This shift in incidence would free the system from its most unsettling and complaint-provoking aspects. Market-demand quotas are difficult to administer, because the regulatory bodies are invested with the responsibility for making economic decisions affecting conflicting interests. This delegation of economic authority to the states constitutes a standing invitation to the extension of controls to other phases of the industry, and even to eventual centralization in the federal government. Therefore, the drift toward further transfers of economic power from the hands of the industry to those of the government can only be reversed by a transfer of emphasis from economic to engineering criteria. The agency for the gradual return to a freer economy is available in the optimum-rate basis for proration. This concept offers a practical engineering standard for limiting production more effectively for conservation objectives, which at the same time creating an adequate degree of derived stability, and minimizing th arbitrary restraints on production.

Large Corporations and Small Enterprises

The oil business, in all its branches, is composed of large and small enterprises operating side by side. Because the industry is a huge activity and highly mechanized, employing some fifteen billion dollars of capital, the large corporate form is a natural resultant reflective of the massive and technologic character of the undertaking. Twenty companies handle about two-thirds of the domestic oil business, with the remainder divided among thousands of smaller units; but far from representing a high concentration of control, this degree of convergence in much less than that characteristic of most other major industries and, in fact, suggests a source of the severe competition that actually exists rather than a setting conducive to monopolistic practices.

The opportunities for the entry of new enterprises into the oil business are naturally greater in good times than bad, but generally it is not difficult for new undertakings to become established in the fields of production and distribution. Here, indeed, it is possible for independent operators to get started with limited resources, for there are practices pursued by the larger companies that are tantamount to a subsidy for the newcomer. In production, in order to gain the advantages of multiple effort and division of risk in the search for oil, the major companies customarily buy protection acreage, contribute "dry-hole" money to the independent wildcatter, and provide a ready market for property once it is proven. Indeed, it is probable that this mechanism is essential to promote the discovery rate; for small operators are almost solely responsible for discoveries by random drilling, indispensable despite the great scientific advances in exploration.

Proof of Competition

In marketing also the new entrant is encouraged by the efforts of the established companies to gain new outlets in the competitive struggle to expand their markets. This process has been carried to such lengths that the field is overcrowded, which not only reveals the cause of the endless complaints that emanate from this sector, but also constitutes in itself the proof of individual opportunity and the presence of vigorous competitive effort. The opportunity present in refining for the establishment of new enterprises is limited to special situations in

proximity to cheap sources of supply; but where conditions are suitable, the small refinery springs up and thrives until the economic setting shifts. Application of conservation principles, however, has narrowed the field of the small plant, and the growing complexity of the refining process is requiring greater outlays of capital per unit of throughput. The fields of trunk pipe-line and tanker transportation are closed to enterprises unable to command the considerable capital necessary to construct units of the requisite size; but the operation of gathering lines, barges, tugs, and trucks attracts small enterprise.

The small firm in the oil business has its sphere of activity in the interstices of the industrial structure, and rounds out the effectiveness of the whole. Although the large corporate form is essential to the conduct of far-flung massive operations, the small unit fills a specialized and localized need and, therefore, thrives if soundly conceived and well managed. There is no phase of technology in any branch of the industry that is not accessible to the smallest operator through competent independent consulting and engineering services. In short, there is nothing involved in the mere size of the ranking companies, nor in their predominance, that is inimical to the opportunities of small enterprise. The division of the business between small, intermediate, and large companies seems to be consistent with the inherent nature of the industry; and such deviations as may exist find their origin not in concentration of control, but in the fact that prior establishment bestows an inevitable advantage.

Pipe-Line Ownership

Perhaps the most persistent criticism directed toward the petroleum industry is that the affiliation of pipe lines with refineries confers upon this form of organization an unfair competitive position. Integration of the refining and transportation functions had its origin in the need for devising a specialized low-cost means for shipment, and in the necessity for assuring a continuous flow of raw material to the plants. Thus the pipe line has developed as an assembly line constituting an integral part of the processing operation. Because of this relationship, the pipe line brings the market for crude oil directly to the well, and the producer sells his oil without commissions and other expenses which would have to be incurred if the transportation system were unrelated financially to the buyer. The pipe line, therefore, is far more than a means for shipping oil; it is structurally a part of the oil industry itself.

Although developed as private transportation systems, as were electric transmission lines, pipe lines have been declared to be common carriers and brought under the supervision of regulatory bodies. They have thus acquired a legal status not wholly consistent with their economic function, and the resolvement of this conflict is the source of much misunderstanding. Critics claim that pipe lines fail to render the communal service expected of a common-carrier system; operators feel that rates and terms of shipment are under the supervision of public authorities upon whom the final responsibility rests. But inasmuch as the pipe lines have been charged with a broader duty than is implied in their functional objectives, the competitive economic advantages of refinery ownership are limited by the responsibilities imposed by the legal status. No shipper can legitimately object to paying a fair rate for the use of the investment made by others; but if the privilege of ownership is employed to restrict the use of the facilities or exact rates that lead to excessive earnings, then the shipper complains that he is penalized in the competitive struggle.

Crude-oil pipe lines have generally been built by companies seeking an adequate and continuing supply of raw material. The lines, therefore, operate on behalf of buyers, and most of the oil to be transported has already been purchased at the time of gathering. Gasoline lines, on the other hand, are usually constructed by enterprises having surplus output which must be transported to distant markets. As others may wish to share in these markets, there is a substantial demand for common-carrier service. It is inevitable, therefore, that pipe lines carrying products will devote increased attention to the adjustment of specialized objectives to common-carrier requirements.

The rate of return on investment in pipe lines has averaged higher than that generally accepted for public utilities, because of the much greater risks involved, the opposition on the part of the railroads and their representatives to lower rates, and the time inevitably required for a complete adjustment to a common-carrier status. The earnings of pipe-line departments, however, are largely accounting concepts rather than cash realities, since most of the oil moved is for the account of the affiliated refineries and the book profits tend to be passed on to the consumer in prices more attuned to costs than tariffs. There is, thus, no significant economic objective to be gained by the industry in supporting any particular level of rates; and now that risks are lessened by the lengthening life of oil fields and products' lines are becoming more firmly established on the basis of experience, the rate structure is naturally undergoing a downward revision. The objections to refinery ownership of pipe lines, accordingly, should largely disappear as the system more fully responds to its public responsibility. The frequently-advanced "solution" by means of divorcement of the pipe-line department from the rest of the industry does not meet the real issue, but evades it by proposing to destroy a sound and useful economic relationship to gain a legal point already in process of adequate establishment. By its own enterprise and initiative, the petroleum industry has developed a most efficient transportation system, and no step should be omitted to insure its continued operation on the most effective plane.

Vertical Integration and Competition

It has been repeatedly asserted that vertical integration in the oil business permits profits made in one division to be used for subsidizing competition in another, and that this circumstance confers an unfair competitive advantage upon the integrated company. This criticism represents a superficial and misleading statement of an underlying relationship and, therefore, does not convey the proper significance. The integrated form in oil is plainly a cost- and waste-reducing mechanism, engendered by the liquidity of the commodity, its highly technologic and mechanized treatment, and the necessity for coordinating scattered and shifting sources of supply with a national market requiring standardized products in small units of sale. Profits in the various divisions of an integrated industry must of necessity vary with different phases of the cycle, and in a free economy it is this variation that regulates capital flow in the directions needed. It would be inexpedient, even if possible, to force the establishment of an even flow

of profits to each segment of the industry. Furthermore, the integrated form is a sort of crop diversification, so to speak, a procedure well-known and favored in agriculture, whereby the whole business is stabilized and protected from the impact of localized fluctuations.

Integration as such is not vulnerable to logical attack, nor are the variations in profits as between divisions. The real source of the complaints goes back to the question whether the integrated form harbors practices that have become fixed which place one division at a permanent disadvantage compared with another. This consideration stands apart from the economic benefits naturally attached to integration as a superior operating form, and occupies a different plane. Even should such conditions be present, the remedy is not a destruction of the existing structure, but a removal of the institutionalized advantages.

The two features most frequently questioned in this connection are unequal price flexibilities as between crude oil and products, and pipe-line tariffs resulting in high book rates of return. Neither condition, so far as it may exist, materially affects the consumer or brings a profit advantage to the industry as a whole. The dilemma faced by the public authorities in designing correctives is that the consumer, who now gets the full benefits of prices based upon integrated costs, would be penalized by legalistic actions disruptive of the integrated pattern. Such complaints have their origin in lagging adjustments to a rapidly-changing setting, and are not inherent in the integrated form. They represent, accordingly, a passing phase, and the industry itself is the best medium for smoothing out such difficulties. A special incentive is present for going further than competitively necessary in speeding up the elimination of such grievances in order to reduce the political pressure for structural change.

Marketing Practices

The marketing division of the oil business in recent years has been the source of a disproportionate volume of complaints. The nature of these disaffections has varied from time to time in reflection of the shifting incidence of economic forces, but in general they relate to the narrowing margins of independent marketers and the efforts of the supplying companies to control dealers. The preponderance of grievances in this field is a natural development, for marketing facilities are substantially overbuilt, making competition here more atomistic and harsh than in the other departments of the business. Periodic attempts to mitigate the intensity of the competitive struggle have been made, without finding a solution to the basic problem, but inducing new phases of criticism directed toward the legal devices employed. The marketing maze with its integrated companies and the multitude of small enterprises engaged in jobbing, distributing, and retailing—linked by changing contractual relationships, varying operating margins, and occasionally by artifice and indirect support—seems almost beyond resolution into a comprehensible economic pattern.

Excessive investment is the primary cause of the abnormal difficulties in marketing, despite the confusing number of forms these troubles have assumed. The phenomenal expansion in gasoline consumption first created substantial profits in distribution, and then the corresponding urge to extend facilities developed a momentum that outran the needs, so that the field has become overcrowded and characterized by high competitive pressures. These stresses are manifest in the efforts of refiners to obtain adequate prices for their output, and of marketers to maintain satisfactory margins between their purchases and sales. Refiners are concerned not only with securing satisfactory prices, but also suitable channels for distribution; and in the efforts to gain the one, sight is often lost of the other. When the struggle for distributing facilities is intense, refiners offer concessions to widen the margin of marketers. If the margin available for the marketing function, implied by the difference between the price obtained by refiners and the price paid by consumers, becomes too large, refiners cut the margin or else enter the field and compete directly or indirectly with the marketers. These alternations of policy, resulting in periodic contraction and expansion in competing channels of distribution, are a source of distress and confusion to the independent operator and the genesis of difficulties for the large companies.

In the relationship between the supplying companies and their dealers, it is felt by the critics that the efforts to tie up dealers by exclusive contracts, special inducements, and other efforts represent an improper use of competitive power, unfair to suppliers less adequately equipped to meet this competition and unduly subversive of the liberties of the dealers themselves. These practices, however, although highly competitive, do not have the appearance of representing more than an intense desire to gain adequate outlets for the product and at the same time insure the requisite standards of service. A more valid complaint, but one less frequently heard, is that the refiners in the aggregate over-intensify the competition by failing to regulate their volume of output more in keeping with the requirements of the market.

Out of this competitive struggle arises the cry for federal intervention to cut the Gordian knot by divorcement of the entire function of distribution from the oil industry proper. Such disruptive action is neither wise nor necessary, and would substitute greater problems for those displaced. The sound remedy for the excessive and chaotic competition in marketing is simple in principle, though slow-acting and difficult of application. Growth of gasoline requirements is still sufficiently rapid for over-capacity to be absorbed in a few years if new investments in marketing are held at a minimum. This could be done if each marketing executive would recognize and act upon sound economic principles: first, by avoiding direct or indirect extensions of facilities unless the most searching economic survey indicates their need and assured profitability; and, second, by developing pricing policies giving full consideration to the functional aspects of prices and margins in regulating both current business relationships and, through capital flow, those of the future.

Price Policies

There are two common complaints about prices in the oil business. One originates outside the industry, and has to do with practices by which prices are named or posted. The other is an internal problem, and is concerned with the levels at which transfers of ownership take place at the various stages between the producer of the raw material and the ultimate consumer of its derivatives.

The less substantial of the complaints centers around so-called price leadership, which is frequently

looked upon as evidence of collusion. The observer notices that a prominent company usually takes the lead in announcing a price change, and that ordinarily its competitors quickly follow. In markets like those for crude oil and the sale of products to the consumer, where a continuous process of trading is economically impracticable, it is necessary from time to time that some well-informed unit take the initiative in changing its quotations in an effort to reflect the underlying economic factors. Because price differentials for such uniform commodities cannot persist in the same market, other companies must follow the leader, unless the price nominated is out of line with their judgment of conditions, in which case the new price is shortly withdrawn. In either event, price uniformity tends to prevail, and its existence is proof of active competition, rather than the contrary. Since the price leader is under considerable compulsion to make correct decisions, lest he lose his competitive position, he customarily is guided not only by his appraisal of underlying conditions of supply and demand, but is also prompted by the trend of deviations from the existing scale on the part of marginal operators.

Intra-industry price problems are far more involved than the mere mechanism of price-change initiation, and indeed are quite perplexing even to those actively engaged in the business. Difficulties arise because of the conflicting interests of different groups. In crude oil, the differentials for quality and location, the price level itself, and the occasional severity of price changes are the sources of misunderstanding which can only be alleviated by the most intelligent direction of the pricing function to avoid lags in the recurrent adjustments to equilibrium levels. Because prices are posted in the oil fields by the buyer, the seller is apt to feel that he has little to say about the price apparently imposed upon him by the purchaser, but generally neither realizes that the primary factor in determining the long-run equilibrium price for crude oil is established by world conditions of supply and demand.

The intermediate spot markets for products in recent years have become attenuated as a result of structural changes in the industry which have acted to reduce the volume of transfers at these points. Trade quotations have, therefore, become less representative than formerly, with the assumption of greater importance on the part of contract sales—but this is a natural evolutionary development, and not the result of design. Contracts are frequently linked to spot markets, and likewise jobber and retailer margins are influenced by the quotations at the refinery. It is doubtful if the spot markets can be made fully representative, and thus greater responsibility is placed upon the pricing mechanism to smooth out the effects of short-term variations and artificialities.

Prices of finished products are determined largely by the absorptive capacities of the markets and the intensities of competition; the influences of raw material costs alone are small. The integrated form tends to iron out any lags or distortions in the intermediate price structures by the time the products reach the consumer, leaving only intra-industry disparities to be removed by price flexibility at all frontier points in the flow. The solution of these problems, with full justice to all interests, calls for a clear perception of underlying economic forces and their social implications, coupled with a thorough appreciation of the bearing of price upon the flow of capital.

Conclusions

At the outset this paper noted six points of criticism directed against the petroleum industry. These complaints are not concerned with conditions touching the interests of the public, but relate to circumstances within the industry that exert differential pressures upon competing groups. No well-grounded objections are included which the industry itself is not in a preferred position to clear away. The customary panaceas advanced—such as governmental intervention or industrial disintegration—are of a severity out of proportion to the gravity of the issues, which are merely incidental maladjustments in a rapidly-changing industry, and do not call for improvised or disruptive action. To avoid such action, however, it is essential that the petroleum industry cultivate a more pervasive sense of social values and adjust the frontiers of competition to the requirements of economics and the dictates of social welfare. To this end the following six suggestions are offered covering policies for the most part now being followed, but the furtherance of which should be expedited, in order not only to remove the sources of existing grievances with their political repercussions, but also to carry forward the operations of this great industry to a position of even higher value to the economy.

1. Accelerate the transition from proration guided by economic criteria such as market demand to proration grounded in engineering standards such as optimum rates, thus furthering the objectives of conservation and minimizing the delegation of economic power to regulatory bodies.

2. Promote a greater awareness of the implications of the common-carrier status of pipe lines, and facilitate the adjustment of their economic function to the social responsibilities imposed.

3. Further the movement of publicity efforts from the plane of explanations and justifications for what has been done to the level of planning to prevent the development of disparities leading to subversive criticisms.

4. Expand the technique of refinery management by anticipating demands and adjusting prices and yields to conform more closely to future requirements, thus sensitizing the response of operating schedules to busines conditions, so that inventories can be more accurately balanced and maintained at economic levels.

5. Recognize more fully the functional aspects of prices and margins in regulating the flow of capital into marketing, and inhibit additional investments in this field until a better balance is attained, avoiding unwise incursions upon business adequately served by existing enterprise and recognizing the advantages of healthy competition in establishing economic boundaries.

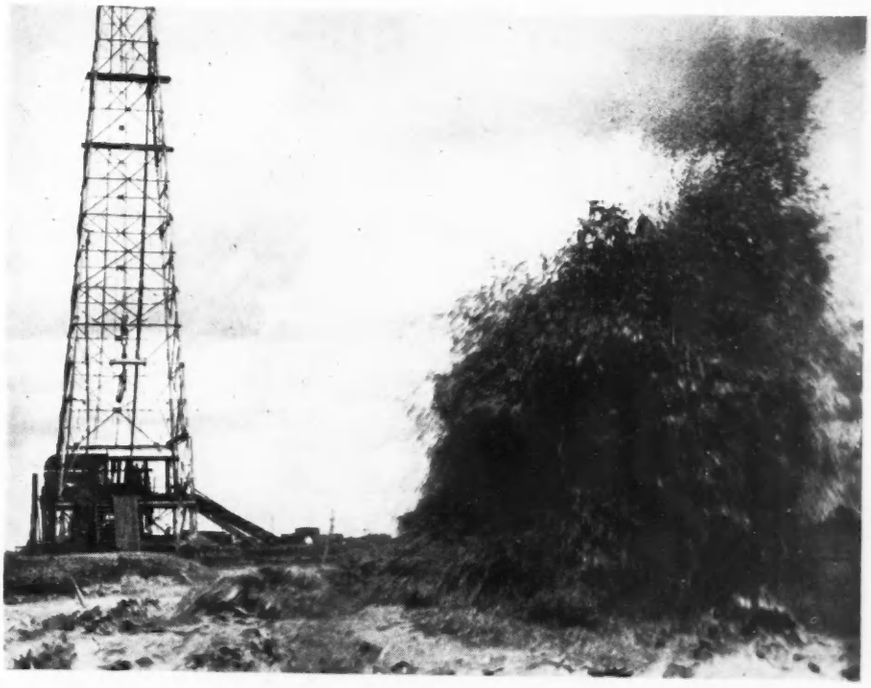
6. Facilitate the pricing of both crude oil and its products on a more sensitive and basic technique, reflecting economic changes promptly and in graduated measure, in order to conserve equilibrium not only in operating conditions, but also in the flow of capital into investments.

Brains and Courage Whip Wild Greta Crater

HIGH pressure gas, monstrous geysers of salt water, debris and steel consuming infernos of flame no longer belch forth from the maw of Greta's wild crater. The Refugio County well, a problem to South Texas engineers for more than three years, has been controlled by a long series of dogged efforts calling for courage as much as for science. The well was plugged November 5.

Five times the well caught on fire. On 10 occasions high explosives were used to snuff out the flames. Pumps installed to clear the crater of salt water were submerged in the debris spewn forth. A highway and railroad were washed away before men could throttle the well.

But they did. The pictures tell chronologically of several important steps taken in conquering one of the most sensational wild wells ever known in South Texas.



A blowout on June 29, 1936, running rampant in the foreground of the picture at right, called for a relief well (at left) 250 feet from National Petroleum Corporation's wild test.

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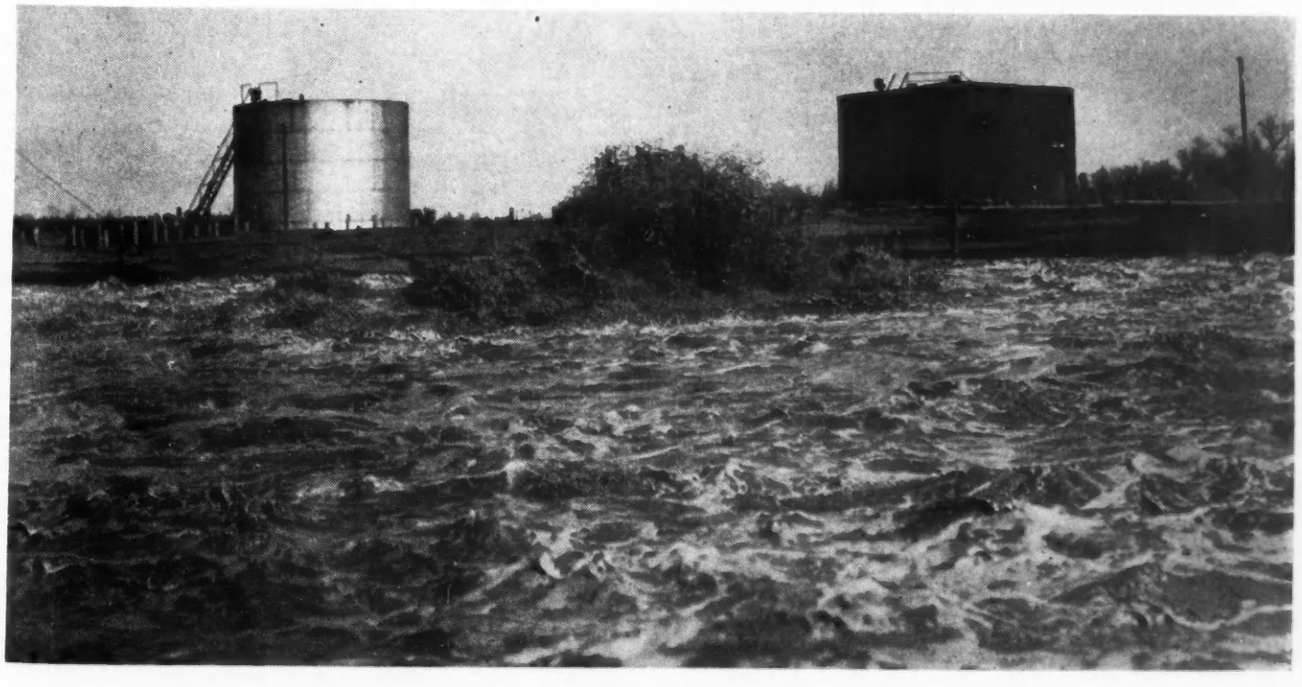
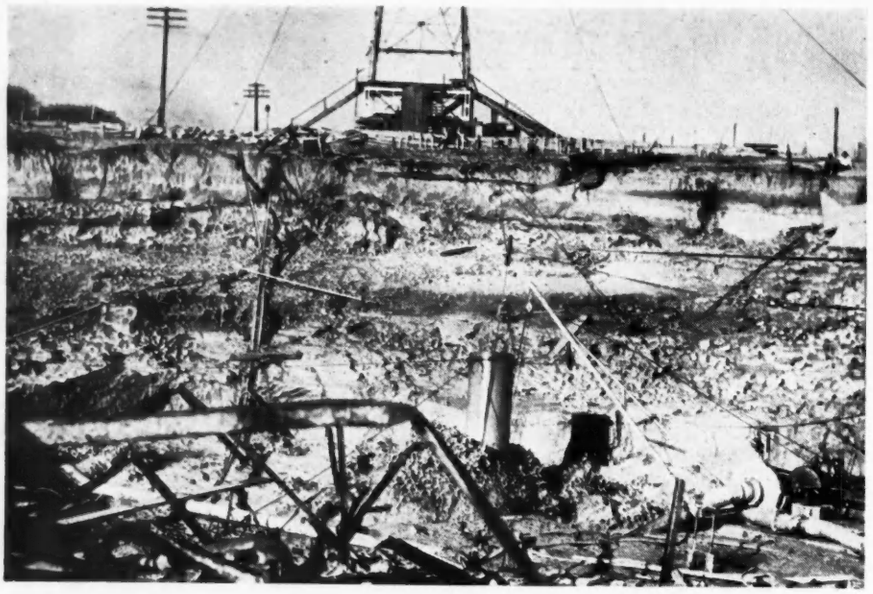
A billowy lake of salt water, below, confronted M. M. Kinley of Houston when he arrived February 24 to direct efforts to control the well. A pump took 1500 gallons of water out hourly as long as the suction would stay unclogged.



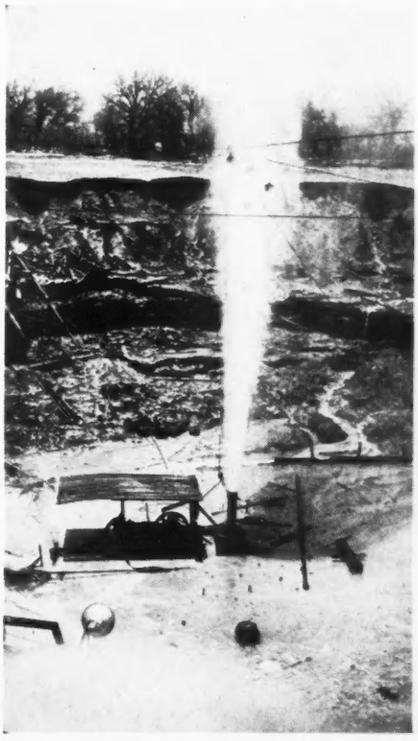


A steamship funnel, 48 inches by 32 feet, shown at left, was brought to put over the submerged casing and break up wave action in the crater, but a rise in the water level caused further delay. Previous attempts to install a 50-foot length of 16-inch pipe over the casing had failed. Swirling debris prevented a stabbing job.

By March 12 the crater level had been lowered from 61.2 to 43.6 feet and it was estimated there was only 8 feet of water left in the inner crater, which was 95 feet in diameter. But the pump was wearing out and the crater was making 500 barrels of salt water hourly. It had already washed away railroad and highway, at right.

Fire hazard was imminent as water in the crater gradually was lowered, so the crew braved the quaking bottom to remove all inflammable materials. At left they are seen with that job nearly completed when . . .

Zoom! The high-pressure gas ignited, and the first of the Greta crater's five fires was well under way, notwithstanding plenty of water still was in evidence. That same gas pressure had two weeks previous burst the welded seams in 16-inch pipe.



The explosion that put the fire out is seen at left. But the next day the fire caught again, and again and again. Four times it was snuffed out with glycerin on March 29, only to catch again April 9—this time in earnest. Six doses of explosives were needed to put it out.

Nerves quieted after that last shot. So did the crater, with the result that a weighted stack, see below, was lowered toward the ruined well's mouth.

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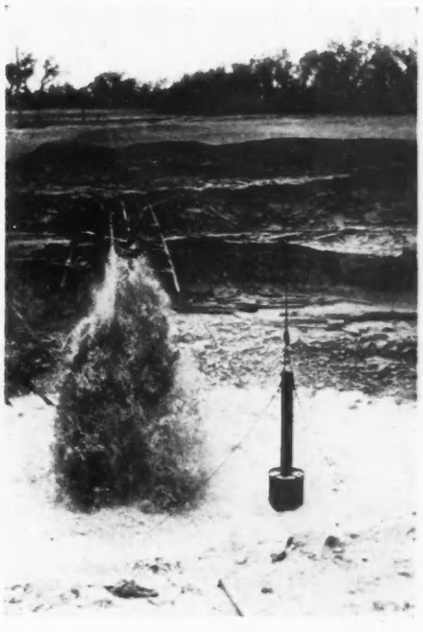
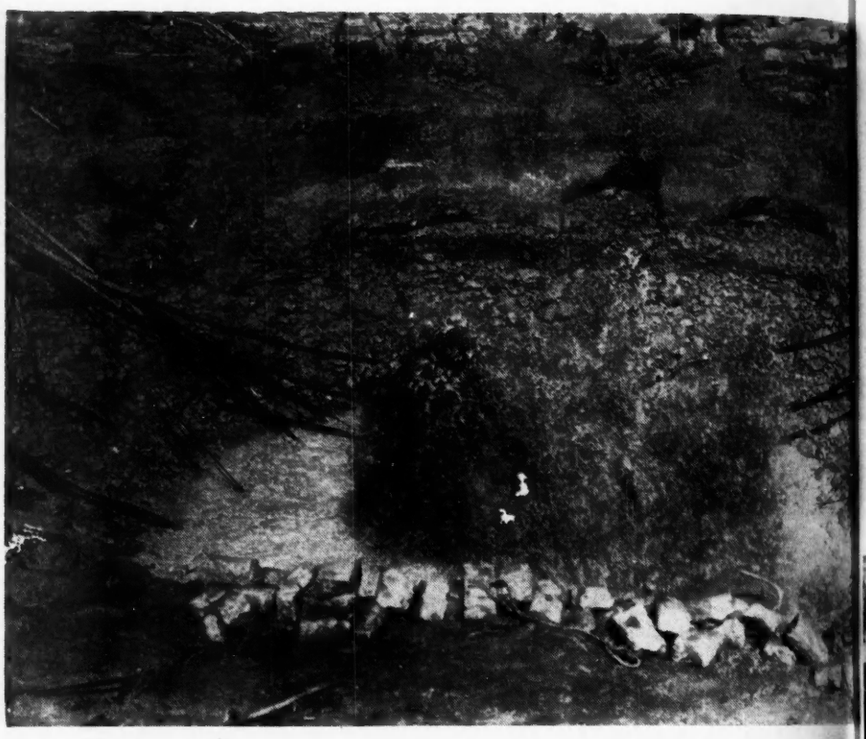
By May 31, water flow being well under control, it was decided to lower equipment, at left, into the crater to mill down through the debris to get a 10-inch pipe down to or over the old casing.



Turbulence of the flow coped with in controlling National Petroleum Corporation's wild well is illustrated in the picture below, taken after things were fairly well in hand. Wreckage and trash worked a terrific hardship on pumps attempting to lift particles of same along with the water. Suction lines clogged up frequently and at times had to be removed for cleaning under conditions of almost unbearable heat.



Success finally crowned efforts to get the weighted stack down over the old casing after the crater had been pumped relatively dry and fire had been extinguished. An oil drum filled with concrete furnished the weight for the job. Note the pressure.

Refugio craters have called forth the best available in cementing technique as the product is applied all along the line in the fight to control rampant pressures. The well at Greta gobbled up hundreds of sacks while the fight to harness pressure from the 4365-foot sand was being made.

Sighs of relief were heard on the job when the pump pressure rose to 1100 pounds when the operation was at the stage shown at left, indicating cement pumped into the well had begun to set—and that the end of the job was in sight.

Below is a job's end view of the once wild crater of Greta. It is flowing through two-inch pipe with a 640-pound pressure. Examination of the well prior to placing the Christmas tree failed to reveal any leaks.

Before final plugging on November 5 the controlled well was allowed to flow through 7-inch and 2-inch valves. It rocked up 30 pounds on the gauge with the 7-inch valve open. Later the flow was confined to the 2-inch valves on either side of the 7-inch.

Effect of Varying Well-Bore Diameters in California Reservoirs

By ERNEST K. PARKS[4]
Consulting Petroleum Engineer

Present trend toward reduction of well diameters has led to inquiry as to effects of this practice. Data obtained do not furnish a solution for optimum choice, but are sufficient to indicate there is doubt that immediate savings are realized fully. A theoretical discussion accompanies facts and comments, with conclusion that further investigation is warranted.

The statements and opinions expressed herein are those of the author, and should not be construed as an official action or opinion of the Institute, or of this magazine.

This paper was presented before the twentieth annual meeting of the American Petroleum Institute at Chicago in November, 1939.

THE present discussion is an outcome of a previous paper[1] initiating the subject of size of oil strings as a problem for consideration in the American Petroleum Institute. The conclusions of that paper are repeated:

"1. The economics of well design involve consideration of production practice.

"2. Investigation of the effect of hole size on production rate appears to be warranted.

"3. The perforated section of the oil string deserves continued study, especially with respect to selection of perforations.

"4. There is a possibility of evaluating the advantages of additional oil-string size for a particular development after prospect wells have revealed physical conditions and production performance."

The effect of well size on production practice has been the primary incentive to further efforts in this study, with the particular object of obtaining facts as to the relation between size of oil string and the production rate. It was realized from the first that convincing rate comparisons are very difficult to obtain, but inquiry developed that this factor is not necessarily decisive. The advantages of a larger bore hole and casing apply also to the drilling of a well; and, therefore, the question reduces to whether such immediate additional costs as may be incurred for a larger-diameter well are justified by the combined effects of the diameter increase upon drilling and production.

The many different conditions of drilling, combined with variations in types of oil and gas reservoirs, would make a nationwide treatment of the subject impracticable. Consequently, this paper is limited to California practice in the drilling of wells to, and producing from, the usual oil-sand accumulations. Special cases deliberately are avoided, with the object of arriving at fundamental conclusions of more general interest.

Prior to examining details, it is in order to recall that it is no longer considered good practice to drill and produce a well to the end of making the greatest possible profit in the least possible time. Attention now is focused upon the reservoir; and, with assistance of cooperative effort and under legislative regulation, the trend now is to temper the quick "payout" policy on the proposition that the increased yields of conservative exploitation, coupled with economic advantages of stabilization, will more than offset the longer time element. This trend results in a restriction on drilling, and also in a determined effort to reduce the cost of such wells as are drilled; for the rate of return is still a basic factor of investment. Under these conditions, it may be said now that the object of a well is to complete it and to produce from it in such a manner that the profit will be the maximum consistent with the orderly development and production practice which controls the situation.

A reduction in the rate of oil yield per well producing, or—more generally—a diminished income as a general result of overproduction, naturally leads to attempts to increase profit by reducing costs of operations. Reductions are immediate and tangible, whereas the effects thereof frequently are delayed, and either doubtful or difficult to evaluate. An illustration is the diameter of a finished well. The difference in cost of the casing involved in a choice of programs can be computed easily, and this difference represents an immediate expense which can be avoided. It naturally follows that reduction of well diameters is the first recourse in curtailing individual well investment.

The choice of the smaller well size, as primarily determined by casing cost, has brought a tendency to still further reduction, supported by three circumstances:

1. The first-cost savings are definite, and appear attractive.

2. The maximum allowable production per well still is following a decreasing trend.

3. The small-diameter completion presents a minimum difficulty in the early flowing life of a well.

On the other hand, there are objections to the small-bore well from the standpoint of drilling as well as from production. These objections, as such, are insufficient to overcome the argument of direct reduction of first cost, but the situation is of sufficient importance to warrant analysis. Accordingly, the California sections of the Drilling and Production Practice Committee sponsored the inquiry, and issued a request for data.

Operators have responded with information upon drilling costs and production rates; and, although the data are insufficient to furnish a statistical average of results, they serve to illustrate the related factors, which will be discussed first in principle.

Theory of Well-Bore Diameter

Assuming that conditions are such that an operator has a choice of the size of bore to be made in the oil sand, and of the size of oil string he can install, his decision presumably would be influenced mostly by so-called practical considerations.

The bore must be sufficiently large to allow economical drilling, safe running of casing, and final installation of a perforated oil string of a size consistent with manner of completion and some minimum producing equipment. There are so many variations of practice as to each of these items that there may be many differences in specifications, without once entering the field of production performance beyond the scope of actual well operations.

Economical drilling, when expressed in terms of least dollars per foot, may mean most feet per day in the majority of cases. Thus fast drilling generally is desired. The question arises: "Is the speed of drilling increased by reducing the bit diameter?" Economical drilling also means a minimum of trouble frequency, and minimum damage when it occurs. What is the effect of reduction of hole diameter on drilling hazards?

The running of casing to modern depths, however successful the usual practice, is fraught with the possibility of sticking and, hence, the selection of a smaller size to be run through a bore hole of more than ample clearance obviously favors that choice.

The immediate result is, however, to create a difficulty in the most important section of the well, i. e., in the producing horizon. As a consequence, the hole drilled through the oil sand often is reduced—necessitating underreaming, and possibly the running of perforated pipe with a small clearance. If the latter happens to be contrary to an operator's practice, the only alternative is an exceptionally-small oil string.

As a part of well equipment, the diameter of the oil string becomes increasingly important with the length of the string and the depth of the well. The length increases the hazard of bending, the probability that repair work must be done, the liability of sticking production equipment, and the difficulties of keeping the well clean. A larger diameter reduces these chances for serious trouble. Again, the deeper the well, the greater is the need for room to accommodate production devices which are designed to meet the requirements of depth.

The next consideration is the effect of the hole size and the liner size on the production of oil and gas into the well. No one will deny that the diameter of the bore hole is without effect, but the question to be answered is: "Does practicable variation in hole size and liner diameter result in appreciable changes in the rate of production and the effective drainage radius of the well?" Current practice limits the choice between a minimum hole of about 6 inches with a 4¾-inch liner, to a maximum of about a 20-inch gravel-packed hole with 8⅝-inch liner—the maximum decreasing with depth. In cases in which the depth dictates a casing program, the selection is limited to a narrow range.

The field evaluation of the effect of the bore hole itself, of course, is obscured by the fact that variations in oil-sand porosity and permeability from one location to another may be very great. Wells seldom are completed in identically the same manner with respect to drilling time, mud condition, running the liner, and placing on production; so that it is not known whether the exposed oil sand has been altered in the same degree with respect to its permeability. The condition which obtains in the annulus about the oil string also is unknown, as is the resultant effect of the screening action through the perforations—which not only may vary from time to time, but also as between wells.

With all this uncertainty as to physical performance, it is no wonder that one prominent operator replies to the committee's letter of inquiry, stating: "Pairs of wells could be selected which would show a great advantage for the larger hole, but other pairs could be found showing a disadvantage for the larger hole." He adds that "our theoretical analysis shows hole size, within the customary range, to have a comparatively small effect upon the potential of a well." This conclusion followed a study of bottom-hole pressure data, which failed to show "any consistent advantage for the larger holes as compared with the slightly smaller holes."

The idea that larger bores are desirable for increasing the production rate is given further discouragement by Muskat[2] who says that ". . . to increase appreciably the production capacity of an artesian or oil well by increasing the size of the well is rather impractical, since . . . it may require an enlargement as high as 40-fold just to double the production capacity."

For the convenience of those who wish to have the radial-flow formula at hand, it is repeated here:

$$Q = \frac{2\pi kh\,(P_e - P_w)}{u \log \frac{r_e}{r_w}}$$

Where:

Q = outflow into the well, in cubic centimeters per second per centimeter of sand.
k = permeability, in darcys.
h = sand thickness, in centimeters.
p_e = reservoir pressure, in atmospheres (absolute) at the outward boundary of the system.
p_w = reservoir pressure, in atmospheres (absolute) at the well.
u = viscosity, in centipoises.
r_e = radius of effective outward boundary of reservoir system, in feet.
r_w = radius of well bore, in feet—

as quoted in Muskat's work, p. 153.

That the difference in production rate by reason of hole size is indeed difficult to evaluate is confirmed by a large major company replying to the inquiry, stating that ". . . too many variables, other than the one which is under examination, enter the comparison cases in an unknown manner."

Ralph B. Lloyd, a member of the General Com-

mittee of the Division of Production, deals with one of these variables in his reply stating: "We . . . have about reached the conclusion, from observations we have made, that it is more important to have the producing sands cleared of the mud infiltration and mud cake so that the sands can produce than it is to have a larger bore. . . ." This is a conclusion which is endorsed by others, as shown by special efforts which are made to minimize sand contamination. Although the avoidance of mud and water damage may be the more important, it is assumed in considering size of bore hole that no good practice is to be sacrificed.

Returning again to theoretical discussion, Herold[5] states: "I have had occasion recently to read again your paper of March 16, 1937, entitled 'Selection of Size of Oil Strings for Wells in California.'[1] In that paper you make reference to a kinetic pressure gradient set up within a natural reservoir as a result of production from a well. In describing the gradient as a quadratic hyperbola with the static pressure gradient and the center line of the well for asympototes to the hyperbola, you, of course, are aware of two circumstances upon which such a description depends, viz.:

"a. Friction resisting the flow within the reservoir is neglected.

"b. Lineal velocity of flow within the reservoir varies as the square root of the pressure.

Actual friction, when taken into consideration, modifies the shape of the gradient to the extent that its curve becomes a compromise between a quadratic hyperbola and a rectangular hyperbola. The assumption of a straight-line relation between lineal velocity and pressure results in a kinetic gradient having a curve with a logarithmic equation. The question as to whether the relations between velocity and pressure are in accordrance with Torricelli's equation (square root) or with Darcy's formula (straight line) will be discussed in my next AIMME paper entitled 'Must We Look for a New Reservoir Control?'[3] Possibly in our practical applications either one of the curves dependent upon velocity-pressure relations will suffice. Perhaps one can say that the equation of a circle, as applied to one quadrant, would be a satisfactory approximation in the determination of actual values at various distances outward from a well.

"Analytical considerations require the proper equation. Only upon such an equation can mathematical operations be performed with an assurance that the result will have a meaning in reservoir performance. But even in connection with the use of the proper analytical equation there are two situations which must not be overlooked, viz.:

"1. Any manipulation of flow from a well sets up a kinetic pressure gradient differing from the earlier gradient. Constants in the equation take on different values for each position of a valve. Furthermore, if a hole were to be reamed out to a larger diameter opposite the producing sand, or if a liner were to be replaced with one having a greater area of perforations per foot of pipe, each such set of conditions would in fact set up a different gradient. In other words, the gradient for a small hole at a particular location is not the same as the gradient for a large hole at the same location. We cannot construct graphically on paper the former gradient, cut it to accommodate the dimensions of the proposed hole, and describe the remainder as the latter gradient. At the present time we are unable to compute one gradient from the values of another gradient under different conditions of production.

"2. Lateral slipping of the gradient toward the well cannot be ignored. For a given well, the slower the production rate, the greater is the opportunty of the gradient to slip, thus keeping oil at the bottom of the well under a greater pressure. Conversely, the faster the production rate, the less is the opportunity for the gradient to slip, for the time involved in lineal velocity and the time required for slippage are competitive. This phenomenon can be observed in flow from a shallow pan with a hole at its center. Only with fast rates of production can the analytical curve of the gradient be approximated. Here again at the present time we are unable to compute slippage at one rate from the values at another rate under different conditions of production."

Herold then discusses a proposal for experimental apparatus to arrive at some empirical data on radial flow, but this is left for consideration in the Drilling and Production Practice Committees.

Another communication was received from Jarvis,[6] who says, "In the fall of 1927 and the spring of 1928, I worked on a problem with a co-author, and submitted a thesis to the University of California on 'The Effect and Advantages of Large-Diameter Wells Over Small-Diameter Wells and Some Studies of Spacing and Time of Completion on Ultimate Recovery of Petroleum from its Reservoir Sands.' I refer you to this work for details as to the apparatus used, experiments performed, and conclusions drawn.

"Among other results it was shown that a large-diameter well (six times the diameter of a small well) has a maximum production rate 29.4 percent greater than that of the small-diameter well. The ultimate recovery by flowing methods of the large well over the small well is 26.1 percent greater, and the gas produced by the small well is 31.5 percent greater than that produced by the large well. This better utilization of the gas (air) may account for the larger recovery and rate of production of the large-diameter well by less 'by-passing.'"

Jarvis then refers to the publications in general of Uren, on kindred subjects, and subscribes to the Darcy equation as applied to radial flow; and concludes: "We know of no actual definite field substantiation of any of the above-mentioned work performed at the University of California or by others. There have been indications in some gravel-packed wells that production is higher, but due to various other variables the results are of such a nature as to be uncertain and not definitely proved. It appears to us that his field offers splendid possibilities for further research." It is to be noted that Jarvis used oil and gas (air) in his experiments.

These references by no means completely describe theoretical considerations, but are deemed sufficient to show that we cannot rest on work already done; and that, although very complex, the field for investigation is especially promising. This is not only true from the stand-point of determining an optimum size of bore hole, but from a comprehensive need for further study of reservoir performance.

Field Observations

Attempts to secure practical examples were, of course, difficult, but a few cases are cited. Weaver[7] states that in the Meyer zone at Santa Fe Springs there were two comparable cases where redrill or plugging operations showed large advantages of 8⅝-inch perforated casing as compared to smaller sizes down to 4¾ inches. He also refers to Huntington Beach directionally-drilled wells, and says: "We still find a very definite advantage in the larger oil strings. Our best wells in this pool all have 6⅝-inch oil strings or liners and, as a whole, they are at least 200 barrels per day better than the best wells which have 4¾-inch oil strings. I believe this pool is declining to the point where

Performance Comparison

WELL	Size of Oil String (Outside Diameter) (Inches)	Initial Rate (Barrels Per Day)	Rate Later (Barrels Per Day)	Elapsed Time from Initial Date (Years)
4-A	8⅝	140	80	3½
4A'	4¾	70	32	3½
18	8⅝	200	46	6
18'	6⅝	25	15	6

we will find exactly the same condition as in the Meyer zone at Santa Fe Springs. I do feel, however, that there is a decided limit to which we can carry a program. I am definitely opposed to any string of perforated pipe smaller than 5¾-inch or 5½-inch, and feel that the instances are rare when it would be desirable to have a perforated string larger than 8⅝ inches. For the average pumping well, I still feel that a 6⅝-inch oil string is an ideal size.

"I am sorry I haven't more concrete examples, but it is a problem to which I have given considerable thought. I have always been sorry that we were unable to get an 11¾-inch, or at least a 10¾-inch, string in the Meyer zone at Santa Fe Springs when we were doing so much repair work and plugging back to this zone. I believe we would find still greater production with the increased size, although the additional drilling and casing cost would probably not be justified. In these wells I have had no experience at all in determining productivity index, and have based my opinion purely on actual well performance."

These cases do not prove the point, but they are sufficiently impressive to cause this operator to prefer larger sizes of oil strings. His reference to drilling cost, of course, refers in this instance to repair work.

A particularly constructive example is supplied by Coleston,[8] showing the results as tabulated and discussed.

Case "A": Example of Large Bore Hole in North Belridge Field (Temblor Sand)

ITEM	Well No. 1	Well No. 2
Water shutoff, feet	5,073	5,074
Top producing sand, feet	5,031	4,996
Size of hole below WSO, inches	8½	8⅜
Reamed size, inches	10⅝	(not reamed)
Initial production, barrel per day	7,130	6,780

Note: "The wells herewith compared were selected with reference to structural position and similar characteristics being as nearly comparable as possible, but with size of hole through the productive formation different."

"Well No. 1, Case 'A,' was deliberately completed with the larger hole to determine the possibility of obtaining increased production by so doing. At first it appeared that the desired object was attained; but when the well rapidly went to water, the increased initial production was attributed more to water drive than increased hole size."

Case "B": (shows large increase for a well No. 3 with 7⅞-inch hole; tabulation omitted).

Note: "Well No. 3, Case 'B,' would seem to verify the larger-hole theory, but it must be pointed out that many wells have been completed in the field with 7⅞-inch hole through the productive formation (conventional completion) ranging in size from 150 barrels per day to 5000 barrels per day; and it is our opinion that, in this field at least, other conditions—principally permeability—have far more effect than hole diameter upon productivity; hence any increased cost of larger hole is not warranted."

This experience is not quoted so much to show that larger bore holes gave increased rates, as to note a very progressive experiment actually conducted with a well in the field. The operator concludes that varying permeability is much more important than size of hole; but this brings up the question of whether a larger bore is not the most valuable in a zone of low permeability.

Again experimentation is suggested; and, although the theory and practical results tend to discourage exceptionally large bores, it is significant to note that preferred minima are still larger than would be the case with so-called "slim-hole" drilling.

Other Practical Considerations

Replies show that size of hole has another practical aspect, i. e., in drilling. An interesting communication is had from Whaley,[9] stating: "You stated that you would like to have our ideas as to the mechanical aspects of the problem.

"During the past few years drilling practice in California on wells to 8000 feet in depth has gradually changed from the use of 8⅝-inch water strings to 7-inch water strings.

"This has been accompanied by a reduction in liner size from 5¾-inch 22½-pound casing to 5-inch 15-pound pipe, effecting a change in inside diameter from 4.990 inches to 4.408 inches. This 0.582-inch reduction in inside dimensions has been objected to by production men for obvious and justifiable reasons. Furthermore, it has been pointed out that the 4.408-inch diameter has not been obtained in all instances, due to bending and out-of-roundness of the pipe.

"Barnsdall's practice in changing from the 8⅝-inch to 7-inch water string has varied from other California operators, insofar as the inside diameter of the liner was maintained with 0.10 inch of the 5¾-inch size. This is accomplished by using 5½-inch 17-pound pipe, which has an inside diameter of 0.892 inches, or 0.484 inch larger than the 5-inch 15-pound pipe. Grade N-80 steel is used to maintain a collapse safety factor comparable to that of the J-55 grade in the old 5¾-inch and the new 5-inch liners.

"In developing this program, it was necessary to arrange for the drilling of the well to its completion

Total Cost of Wells Drilled by Same Rig, Same Crew, Same Field, Different Sizes; in Los Angeles Basin

	WELL "A"	WELL "B"
Total Depth	7,534 ft.	7,513 ft.
First String	1,065 ft. (±) of 11¾-in	1,066 ft. of 13⅜-in.
Size of drilled hole	17 in.	19⅞ in.
Drilling time	4 days	3 days
Second String	7,440 ft. (±) of 7-in.	7,439 ft. of 8⅝-in.
Size of drilled hole	10⅝ in.	12¼ in.
Drilling time	51 days	34 days
Total drilling time	55 days	37 days
Cored footage	224 ft.	112 ft.
Various bits and reamers used	2—17-in. (1 bit; 1 reamer) 3—10⅝-in. drag bits 19—10⅝-in. rock bits 2—10⅝-in. rock reamers 4—8½-in. core shoes	2—19⅞-in. (1 bit; 1 reamer) 1—12¼-in. drag bit 19—12¼-in. rock bits 2—12¼-in. rock reamers 2—9⅝-in. core shoes
Total	30	26
Liner [length, 100 ft. (±)]	5½ in.	7 in.
Cost	$81,390	$64,543

depth prior to setting the 7-inch casing. The drilling procedure is as follows:

"Drilling is started by cutting a 17½-inch hole, using 5-9/16-inch-outside-diameter drill pipe and roller bits. This size hole is carried to 1000 feet, where the 13⅜-inch 61-pound casing is cemented, bringing the cement to the surface.

"Drilling is continued with 4½-inch drill pipe, and 10⅝-inch roller bits are used to drill to a point 20 feet below the setting depth of the 7-inch pipe; then the hole is drilled to its completion depth with 7⅝-inch roller bits.

"The 7-inch casing is then cemented, leaving a 20-foot cement plug below the shoe. After testing the shutoff, the 20-foot interval below the shoe is wall-scraped to 7⅝ inches to remove the cement, and the well is cleaned out to bottom with a 6-inch bit.

"The 5½-inch flush-joint liner is then run, with a cement bull-plug shoe and a slip-type lead-seal hanger, which is set 15 feet above the 7-inch shoe.

"The advantages obtained in this program are dependent on drilling the well to its completion depth prior to setting the 7-inch casing. Otherwise, if casing is set first, the hole below the shoe must be cut with 6-inch bits, using 3½-inch drill pipe. This setup digs 33 percent slower than 7⅝-inch bits on 4½-inch drill pipe. Efficiency of coring drops very markedly when bits smaller than 7⅝ inches are used. If more than 100 feet of 5½-inch liner is to be run, the hole below the 7-inch shoe has to be under-reamed out to 7½ inches.

"The additional cost incurred by slower drilling, underreaming, and less efficient coring would offset most of the saving effected with the 7-inch and 5-inch program, as compared with the 8⅝-inch and 5¾-inch program. This saving has been found to be approximately 15 percent of the total cost of drilling in an area where comparatively hard formations are encountered.

"As a means of obtaining further economies, consideration is being given to the possibility of cutting 9⅝-inch hole instead of 10⅝-inch hole, using 4½-inch drill pipe."

This detailed explanation is given to show one operator's skillful effort to reduce costs by decreasing casing size, and yet to maintain the oil string to a convenient diameter. This case illustrates the practical importance attached to keeping the oil string from abritrary reduction to a smaller size.

Referring to Whaley's remarks on drilling cost and size of bore hole, we introduce a comparison submitted by Beissinger,[10] who shows results as tabulated.

This example, which is not for general proof of greater expense with smaller hole and casing, does show that larger well bores are not necessarily more costly.

The same idea is advanced by Porter,[11] who shows that in the North Belridge field, in comparing drilling time, the following data are found:

Drilling Time Vs. Casing Size

	7⅝" or 7" to 8,000 Ft. (±)	8⅝" or 9" to 8,000 Ft. (±)
Average depth of size shown, ft.	8,060	8,150
Total depth (average), ft.	8,495	8,540
Total drilling time (average), days	149	92

It is realized that one would wish to inquire into other factors before concluding that larger hole size was responsible for faster drilling, but inquiry in California will yield a strong opinion that small hole is not necessarily synonymous with low cost.

Porter also points out that production data for the Elk Hills field, involving a comparison of liner size, show that those with 6⅝-inch liners had an accumulated production twice that for wells with 4¾-inch liners. Wells with 8⅝-inch liners had 11 percent greater cumulative than wells with the 6⅝-inch size. Again, it is admitted that production comparisons involve many variables, but the cases of increased totals for groups of wells with larger oil strings are certainly significant.

Porter also says: "The far end of the producing life of the well is the thing which doubtlessly prompts the selection of the larger strings or liners." In this he has particular reference to installation of adequate production appliances, and to his comment that "added well costs from $0 to $7500 for a larger casing program to insure flexibility are, in their way, considered 'cheap insurance' for any $100,000 investment over a 10- to 20-year period . . . particularly . . . if such protection by the expenditure of 7 percent of the investment is likely to yield 20 to 25 percent increased returns."

Similar conclusions are submitted by Dievendorff[12] in quotations from a detailed exhibit he very generously prepared on conditions in the new Coalinga Nose field, where wells are from 7000 feet to 8500 feet deep. He prefers 9⅝-inch or 8⅝-inch set inside 12¼-inch hole over 7-inch in 10⅝-inch hole, for specific reasons:

1. "We can drill the 12¼-inch hole with less bits and in shorter time than . . . drilling 10⅝-inch rotary holes."

DATA	12¼" Holes	10⅝" Holes
Average depth of hole	6,486 ft. (from 610 ft.)	6,708 ft. (from 620 ft.)
Number of Wells	15	3
Bits per well	35.87	64.3
Drilling days to cementing depth	34.4	71.66

2. "We believe we are right in contending that the 12¼-inch rock bits are more adapted to the drilling at East Coalinga Extension field (Colinga Nose) than the 10⅝-inch rock bits." (Attention is called to larger and stronger bearings and cutting teeth of the larger bit.)

3. "Larger hole provides insurance against trouble in washing-over."

4. "History of all fields shows that sooner or later remedial work has to be done in the wells. When using 9⅝-inch or 8⅝-inch casing, this work can be done; but in the case of 7-inch casing the work becomes a real problem. . . ."

5. The surface formations are such that the water strings might be collapsed, and: "In case 9⅝-inch or 8⅝-inch casing were used, there would be a chance for remedial work in the form of a smaller size of casing. When using 7-inch casing, this would be an impossibility."

6. The larger sizes insure the hole, i. e.: "If, by any chance, the walls of the hole sluff and the casing 'freezes,' a smaller string can be run and still obtain a well at a minimum cost."

7. "Large holes would allow larger liners. When the pumping stage has been reached a 6⅝-inch liner,

or larger, is very desirable" to facilitate installation and removal of larger equipment.

An Opinion, and Comments

Having consulted operators in a search for data, with but meager success, a general discussion was sought by one who is well qualified to contribute his views. The following is from Mr. Brantly:[13] "At the present time practically all wells in all fields throughout the country are curtailed to a daily production which, in some areas, will yield sufficient oil to satisfy the market demand, and in others the allowed production is presumably based on that maximum daily withdrawal that will cause the minimum decrease in bottom-hole pressure and eventually will result in the maximum ultimate recovery in the given sand or in the given field. Bearing in mind the very substantial quantity of proven oil reserves and the greatly-improved ability of the finders, it seems likely that there will continue to be rigid curtailment for a number of years in the future. Small stripping wells and the great majority of pumping wells will not be affected by this curtailment because of the fact that their production is relatively low without having to be controlled. It would seem to me, then, that the primary point for consideration is the most economical size hole to drill and casing to set—bearing in mind the character of the oil, the depth to the sands, and the type of pumping equipment to be used eventually. Obviously the shallower the producing sands are, and the lighter the gravity of the oil is, the smaller the hole that may be drilled and casing and tubing that may be run. Conversely, as the gravity of the oil decreases or the depth of the hole increases, the size of the hole, casing, and tubing must be increased.

"Probably 2-inch tubing is of sufficient size to flow the allowable quantity of high-gravity oil in any of the present-day fields. On the other hand, the frictional resistance of heavy oils is such that it cannot be economically used in heavy-gravity areas. Also 2-inch tubing is not always large enough for the pumping equipment to be used.

"The limitations of, and the proper sizes to be run under various conditions, require much study—which, of course, is the purpose of the paper which you are preparing; but I think the subject can be approached more logically as discussed above, rather than from the standpoint of the drilling of wells that will have the maximum potential—within, of course, sound economic limits of well costs.

"It is now, and has long been, my opinion that the California operators drill over-sized holes and set casing and tubing that is unnecessarily large. I base this opinion on my knowledge of common practice in the Mid-Continent and in foreign fields. It would seem to me that a proper consideration of this subject would probably lead to a substantial reduction in the drilling cost of oil and gas wells in California."

Mr. Brantly holds the same view as is reflected in the current urge to reduce hole sizes. Engineers who oppose reduction are faced with the very practical argument that the use of smaller casings indicates an immediate saving; whereas the advantages of larger sizes is subject to a deferred return, under the present circumstances, which does not permit of much more extension of the payout period.

Conclusions

1. There is a strong economic urge to reduce the size of oil-well casings.

2. Whatever reduction in potential rate accompanies the smaller size is discounted on the basis of present overproduction.

3. Whatever effect small size has on cumulative production is discounted because of the application of the present-worth factor.

4. There is a definite conviction by some operators that smaller-sized wells do not result in lower drilling costs.

5. Future difficulty with production equipment in small-bore wells has not been evaluated.

6. The inability of operators to furnish data on the effect of hole size on production performance indicates that evaluation of "many unknown factors" is highly desirable.

7. A detailed study of this problem is associated intimately with well-completion practice generally.

8. Differences as to the effect of hole size on drilling cost suggests that, if savings are to be made, there must be consideration of the particular formations encountered and the entire drilling-rig assembly.

9. Whatever effort is expended in providing a solution for the optimum hole size will be direct contribution to genuine conservation of petroleum, material, and manpower in that the factors involved are, respectively: cumulative production to an economic limit, steel for wells, and drilling time.

10 The petroleum engineer and technologist, as many times before, is faced with the problem of obtaining difficult quantitative data so that he can advise intelligently upon well design as influenced by economic conditions.

Acknowledgments

The author is indebted to all those who supplied data, to the chairman of the California Production Practice Committee and the chairman of the California Drilling Practice Committee: Messrs. Paul Lehr and Stender Sweeney, respectively. The questionnaire was circulated to the other district chairmen of the Topical Committees on Drilling and Production Practice, and thanks is due them for their cooperation in discussing the subject as related to their particular reservoir conditions.

Bibliography

[1] Ernest K. Parks, "Selection of Size of Oil Strings for Wells in California," *Drilling and Production Practice, 1937*, 41.

[2] M. Muskat, *The Flow of Homogeneous Fluids through Porous Media*, 156, McGraw-Hill, New York (1937).

[3] Stanley C. Herold, paper presented before Division of Production, *Am. Inst. Mining Met. Engrs.*, Los Angeles, Calif, Oct. 19 (1939).

[4] Consulting Petroleum Engineer, Los Angeles, Calif.

[5] S. C. Herold, consultant, Los Angeles, Calif.; reply to inquiry.

[6] W. L. Jarvis, The Texas Co., Los Angeles, Calif., Oct. 2, 1939.

[7] Don K. Weaver, Wilshire Oil Corp., Norwalk, Calif., Aug. 14, 1939.

[8] C. E. Coleston, Belridge Oil Co., McKittrick, Calif., through J. B. Wharton, Aug. 23, 1939.

[9] W. C. Whaley, Barnsdall Oil Co., Calif. Div. Los Angeles, Sept. 13, 1939.

[10] V. J. Beissinger, Richfield Oil Corp., Los Angeles, Calif.

[11] L. E. Porter, Richfield Oil Corp., Los Angeles, Calif.; various data collected.

[12] H. M. Dievendorff, Robert S. Lytle, Operator; Coalinga, Calif., Sept. 11, 1939.

[13] J. E. Brantly, Drilling and Exploration Co., Inc., Los Angeles, Calif.; Sept. 27, 1939.

As has been the case in progress made thus far, the objective yet to be reached will be realized only through closest co-operation of employer and employee, illustrated here by the drive to insure wearing safety shoes.

"Accidents Will Happen"— Proven To Be False Theory Today

By JAMES R. CHAMBERS

LOOKING back over the records for the past few years on accidents and the cost of accidents in the industrial world, we discover that the old adage of "accidents will happen" rapidly is becoming a disproved theory. In its place we find that accidents not only can be curbed and controlled; they can be prevented in most cases through education.

It is recorded that some industrial concerns have reduced their accident rate from 50 to 90 percent. It is not uncommon to find records that extend over a period of years of man-hours of labor without a single lost time accident.

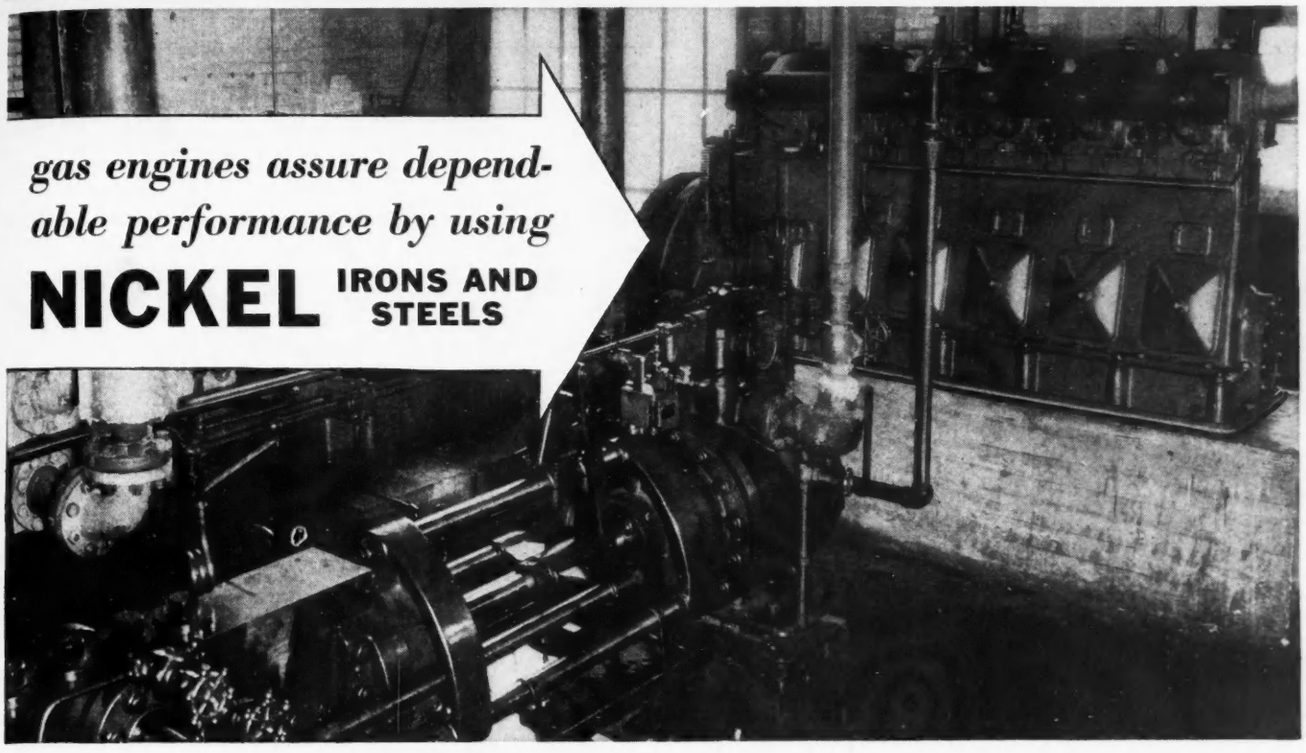
Work Expands—not Accidents

Although it might be expected that the increases in employment and expansion in operations that have accompanied the rapid growth of the oil industry during the past decade would create a higher rate of accidents, this has not been true. Due to the cooperative efforts of employer and employe toward the common goal of banishing accidents, statistics reflect a large decline in industrial accident rates.

One of the most important developments in connection with safety work in the past 10 years has been the change in the attitude of executives toward that work. Their conception of the dollar value of safety as an industrial investment is completely different. Not so long ago it was generally taken for granted that if too much time were consumed in safely performing a given task, production speed would suffer accordingly, thus bringing about an attendant increase in labor and finished product cost.

On the contrary, while the imme-

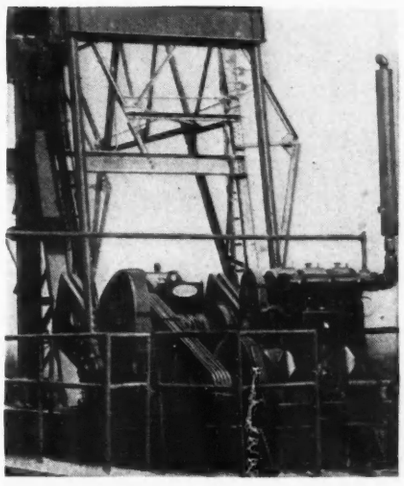
RUGGED TRANSIT



gas engines assure dependable performance by using

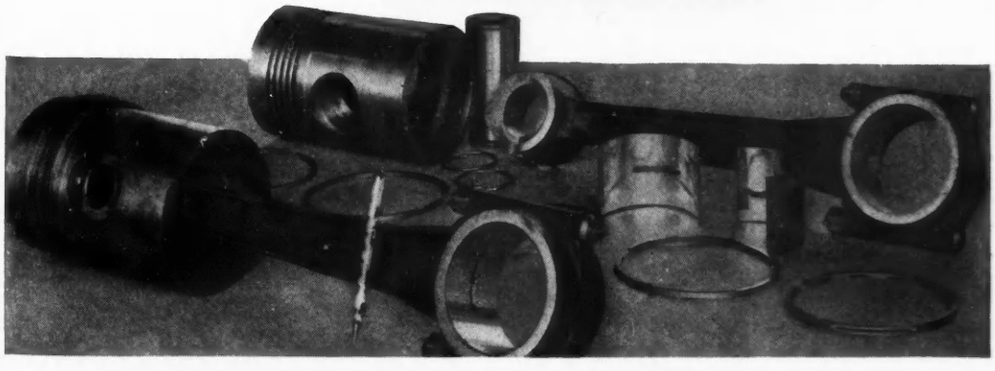
NICKEL IRONS AND STEELS

Transit vertical gas engines, moderate speed units for heavy duty, stand up under severe service and operate continuously for long periods of time. This 6-cylinder 6″ x 9″ Transit engine serves a Western Pennsylvania refinery. From Nickel-chromium steel main bearing studs, SAE 3140, to Nickel cast iron liners, heads and pistons, Transit engines are made more rugged by using Nickel to strengthen and toughen metals.



This 3-cylinder 6″ x 9″ Transit gas engine is pumping with a Lufkin Twin. For strength where the stress comes, Transit engineers have long specified Nickel alloy steels and Nickel cast irons. Nickel alloyed materials withstand stress and fatigue, and stubbornly resist wear.

These pistons, cast in the Oil City, Pa. works of the National Transit Pump and Machine Co., are 1.00/1.50% Nickel iron with a high tensile strength. Cylinder heads contain 1.00% Nickel, cam shaft sprockets, 1.50%. Cylinder liners are centrifugally cast from a Nickel-chromium-molybdenum composition to a hardness of upwards of BHN 200. Connecting rod bolts are of SAE 2330 3½% Nickel steel providing tensile strengths up to 115,000 p.s.i. You're always safe, and usually money ahead, when you specify Nickel alloyed metals for the hard jobs.



THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

Showing how the employees pictured on the foregoing page have co-operated to eliminate one cause of accidents, improperly constructed footwear.

diate and preliminary cost of safety practice installation may seem somewhat large, its installation takes but a short while to establish that inefficiency and accidents have been traveling hand in hand—to establish that removal of either of these constitutes a definite step toward realization of peak production speed. The records speak plainly: "Safely working workers work faster."

Several Factors Responsible

While several factors have contributed to and are responsible in part for the large decline in industrial accidents during the past few years, one of the most important of these has been the tendency of foresighted employers to make analytical studies of working conditions and employe environment.

There are a number of subdivisions into which such a study can delve, such as the manner of promotion of safer working conditions, the encouragement of employe initiative, as well as executive initiative, in accident elimination theory and practice, and the generation—by deeds—of the conviction on the part of employes that the management is sincerely concerned with the welfare of the individual employe.

In other words, the voice of the successful management today may be summed up in the following quotation:

Men First, Production Second

"If we can aid in any manner so as to be able to save only one arm, one leg, one eye, or any other physical property of the workman, or even be instrumental in the cause to eliminate industrial accidents, then we are more than repaid for any expense incurred on our part on behalf of promoting a safety program."

That sentiment, and the frequent expression thereof, is largely responsible for the prevalent feeling that now is a dominant factor between employer and employe in striving toward mutually beneficial working conditions.

In cases where such a feeling has been built up between employer and employe, in cases where the latter has become convinced that the management really has his welfare at heart, in cases where he has been justified by treatment in believing that his company's policy is one of "men first, production second," the employe has reciprocated with a most wholesome cooperative spirit, a spirit that has been reflected in improved work and fewer accidents.

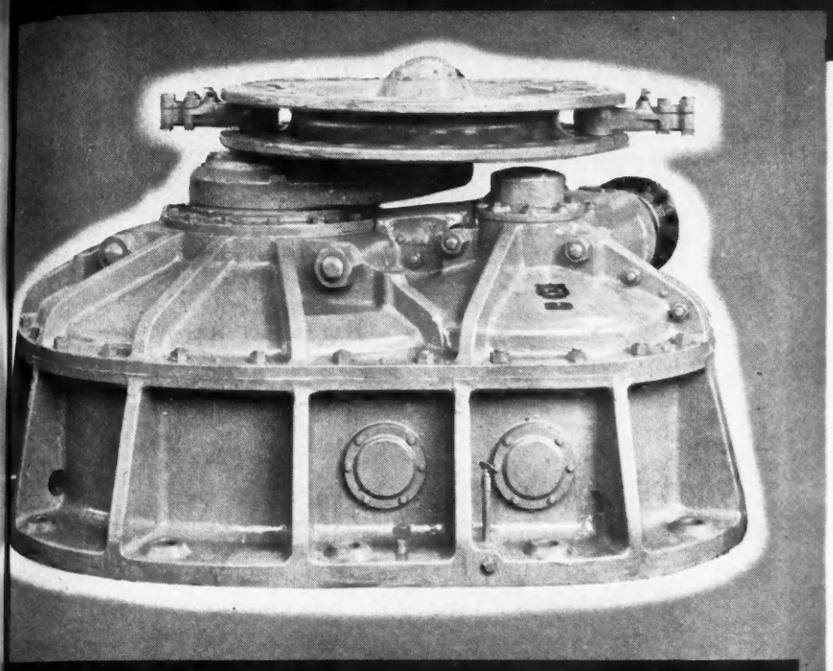
The Safety Engineer

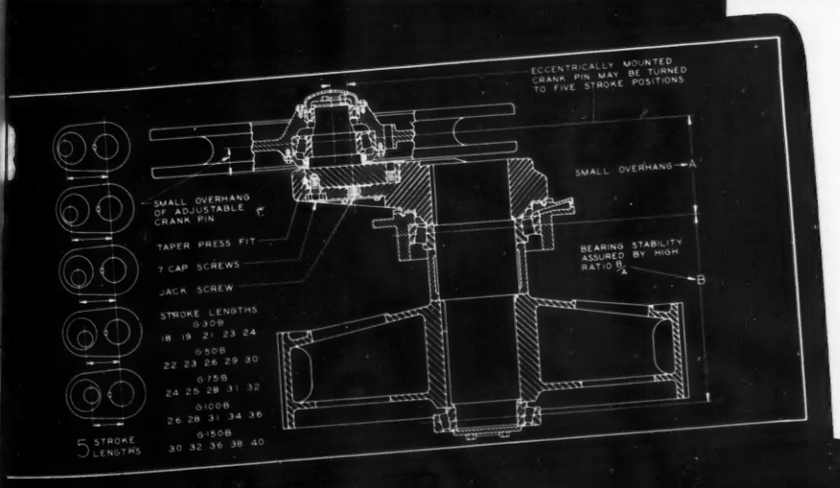
A study of working conditions and environment has been alluded to. This has been reflected in some localities by construction of safety halls where oil company employes may assemble, by installation of libraries, by employment of specialists in accident prevention, such as a corps of trained safety engineers who regularly attend functions of the employes and offer advice and suggestions.

From the standpoint of morale, the proficient safety engineer is a valuable man on any pay roll. He creates a better understanding of the principles upon which safety practices are built. In a way the employe sees in him a man bent upon improving the worker's status at and away from work, a man with whom he is perhaps less reticent to discuss problems,

First aid training is essential both on and off the job. Outdoor work, such as that which the above group has been doing, should be supplemented by hall lectures.

A New Feature ... THAT ADDS TO THE UTILITY OF NATIONAL GEARED POWERS





NATIONAL Geared Pumping Powers are now made with five adjustable stroke positions. This provision, to meet changing field requirements, has been accomplished without adding to crank overhang.

Capacity for all central power requirements is offered by the complete National Geared Power Line.

BRIEF SPECIFICATIONS

TYPES	G-30-B	G-50-B	G-75-B	G-100-B	G-150-B
Nominal hp rating at 20 spm	30	54	75	91	144
Peak Torque rating 20 spm inch lbs.	150,000	270,000	371,000	452,000	714,500
Stroke Length Maximum	24	30	32	36	40
Stroke Length Minimum	18	22	24	26	30
Connection Holes	20	20	20	20	24

NSCO

NATIONAL

THE NATIONAL SUPPLY COMPANY

EXECUTIVE OFFICES: PITTSBURGH, PA. DIVISION OFFICES: FT. WORTH, TEXAS; TULSA, OKLA.; TORRANCE, CALIF. GENERAL SALES OFFICE: TOLEDO, OHIO

whether they be industrial or domestic.

For example: An employe recently has had sickness in his family; he had been worrying constantly. Expenses have soared above his income; he is unable to meet newly acquired debts. Possibly thoughts of losing his job haunt him. His mind is not on his daily job, not on the movements of his hands or feet. Worry over domestic misfortune has made him a living hazard to fellow employes.

And there is where the safety engineer comes in. After discussing a problem of this nature with his management's representative, the employe is assured that everything will work out fine and that the management will do everything within its power to help him during his misfortune. He may even be good naturedly reprimanded for not discussing his problem sooner.

The employe then returns to his job greatly relieved of his constant worries and with deepest appreciation of the fact that he is an employe of such a great industrial unit as his company is bound to be. And generally he is at no pains to hide his attitude. He can just naturally turn out more and better work when feeling thus.

First Aid Training

Oil company safety and first aid teams used to be something of a rarity. In recent years the habit of offering first aid training to all employes has become common in well managed organizations. Knowledge obtained from such training has proven beneficial to the trainee both on and off duty.

From the safety engineering angle, one of the more valuable aspects of the properly conducted course is that the first aid student must learn how any accident he is going to be taught to cope with could have been prevented. A wealth of accident prevention knowledge thus falls to the man while he is learning how to deal with emergencies. Absorbing such knowledge might be monotonous to an occasional employe, but the dish is spiced for him by the "kick" he gets out of learning how to apply a splint, tourniquet, or artificial respiration in a professional manner.

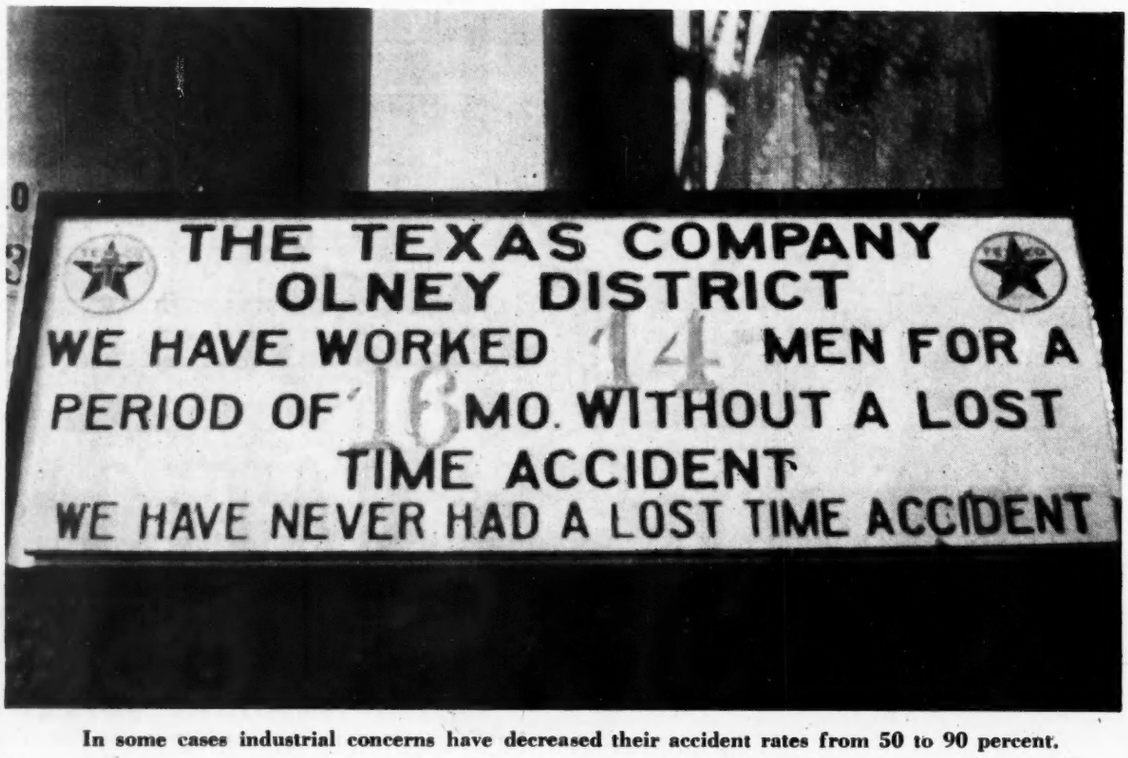
As it works today, employes are taught by a man holding a first aid certificate who has become eligible for the job by passing an examination before the company management. Upon completion of the course the employe is given a diploma stating he has passed the necessary requirements and is eligible for an award. First aid then becomes part of his regular "safety first" work.

It has been found worthwhile to hold safety meetings regularly and uniformly. These are conducted solely by employees, who elect committees and appoint officers from their own personnel. A written form of the minutes is filed with the management, telling of committees appointed by the employes to seek out this and that hazard and determine steps to eliminate same, telling of committees appointed to see what can be done about replacing or remodeling this or that tool or piece of equipment which constitutes a hazard while being used.

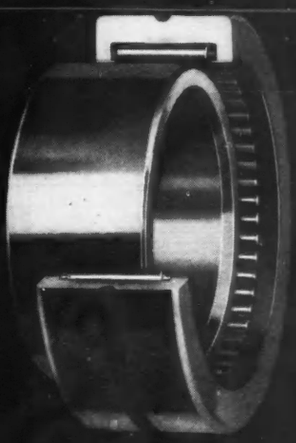
At these meetings are formed first aid committees to give talks and demonstrations on the many phases of applying first aid treatments, with the emphasis always being placed on exigencies not dealt with in the routine training which most of the attendants have already received. Arrangements and preparation of safety first bulletins and slogans are dealt with in the meetings.

In conclusion, it may be said that the work of those sincerely and actively engaged in safety has been crowned with success. Possibly the main factor responsible for this has been the mutual understanding by employer and employe that it behooves both of them to know that safety first pays physically, morally and financially.

It may be also said in conclusion that all the rules you may establish will not completely eradicate accidents from records forever; they will cut those accidents almost to the irreducible minimum, which, in anybody's language, is a situation devoutly to be wished.


THE TEXAS COMPANY
OLNEY DISTRICT
WE HAVE WORKED 14 MEN FOR A
PERIOD OF 16 MO. WITHOUT A LOST
TIME ACCIDENT
WE HAVE NEVER HAD A LOST TIME ACCIDENT

In some cases industrial concerns have decreased their accident rates from 50 to 90 percent.



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Prompt Shipment From Stock
Shaft sizes 1/2" to 5"

Write us for Bulletin 103J. For Needle Bearings to be used in lighter service, write our affiliate, The Torrington Co., Torrington, Conn. Ask for Circular 21A.

OILWELL" SC-10 PUMPING UNITS *Insure Durability* WITH BANTAM QUILL BEARINGS

OILWELL'S new SC-10 pumping units are proving their durability and dependability to the complete satisfaction of users everywhere.

Important improved features include Bantam Quill Bearings in the new-type pitman and in the pull-rod strap for pumping a second well.

Bantam Quill Bearings have won such favor in this type service that they are now the recognized standard throughout the industry. When you buy your next pumping unit, we suggest that you insist it be Bantam Quill Bearing equipped.

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BANTAM BEARINGS

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HIGHLIGHTS IN THE WEEK'S NEWS

Courts

Oil firms charged with California price fixing

The stage was set for another Madison trial, in Los Angeles, as a special federal grand jury on November 13 indicted 40 major and minor oil firms for conspiring to control the retail prices of gasoline, in violation of the Sherman Anti-Trust Act. The indictments were returned after several months of investigation, during which federal prosecutors sought to determine the reason for the "remarkable stability" shown in gasoline prices for the past several years.

Charges 95 Percent Control

Joseph Brill, attorney general's assistant in charge of the investigation, declared that the indicted companies controlled about 95 percent of the gasoline sold on the Pacific coast.

Among those named as defendants are Standard Oil Company of California, The Texas Company, General Petroleum Corporation of California, Richfield Oil Corporation, Shell Oil Company of California, Tide Water Associated Oil Company, Union Oil Company of California, and 30 smaller organizations.

The government charged that part of the combine's well-ramified plan to control prices was the formation of two organizations: the Fair Practices Association, composed of major and secondary companies, and the Independent Refiners Association of California, Inc. The indictments were based partially on the charge that the major companies insisted that the independent refiners maintain a certain price scale or lose the opportunity to sell gasoline to the majors.

Others Indicted

In addition to the major companies, others named in the indictment were these oil concerns: Gilmore, Rio Grande, Seaside, Signal, Sunset, Aromaline, Inc., R. R. Bush, California Oil & Refining, Century, Caminol, Eagle, East-West, El Camino, El Tejon, Envoy Estado, Exeter, Fletcher, Hancock, Harbor, Kern, MacMillan, Mercury, Mohawk, Norwalk, Olympic, Pan-Pacific, Petrol, Rothschild, Socal, Triangle, White Star, Independent Refiners Association of California, Inc., and Fair Practices association.

Government seeks damages in Elk Hills oil suit

Immediate proceedings by the General Land Office for an accounting of damages for oil removed and to secure title for the federal government to Section 36 in the Elk Hills (California) oil field were ordered November 17 by Secretary of the Interior Harold L. Ickes.

The order was issued immediately following a decision of the California Circuit Court of Appeals November 16, affirming a decision of the Federal District Court and ordering Standard Oil Company of California to pay $6,214,-102 in damages.

"I am immensely pleased with the action of the Court of Appeals," Ickes declared in announcing his order to the General Land Office. "Its decision goes a long way toward returning to the people this immensely valuable natural resource so vital to the United States, especially from the standpoint of national defense. The Department of the Interior will proceed to collect damages due and take possession of the property without delay on its part."

Famous "Section 36"

The "Section 36" case is one of the most notable of the various proceedings brought by the government in connection with its oil lands. It was initiated in May, 1925, when the Interior Department challenged the right to private ownership of the property in the section.

Under legislation enacted by congress in 1853, sections 16 and 36 of every township of public lands in California were granted to the state for public school use. The courts later construed the law as amendable to the general mineral land exclusion policies of the government, but the Standard Oil Company, into whose hands the particular section at issue finally fell, contended that the property had not been recognized as mineral in character at time approval of a survey of the lands was given by the General Land Office in 1903.

Challenges Ownership

In challenging the company's ownership, Secretary Ickes ruled that the land was known to be mineral in character before 1903, and the issue was carried to the courts.

During the course of the trial, it was pointed out by department officials, it was developed that production from the Section 36 portion of the Elk Hills area had included 4,978,000 barrels of crude oil valued at $8,300,000, 60,140,-000 million cubic feet of dry gas valued at $3,000,000, and 12,981,000 gallons of gasoline valued at $1,104,000.

Allred-Powers hot oil suit set for trial

Fourteen months after their indictment by a federal grand jury, Renne Allred Jr. and Neal Powers will be tried November 20 in Federal District Court in Houston on charges of conspiracy to violate the Connally Act. Judge James C. Wilson will sit in the case.

Hines Involved

The two, with H. E. Hines, Kentucky oil man, were charged in the original indictment with conspiracy to transport illegally produced oil from the Conroe field in the Texas Gulf coast to Marcus Hook, Pennsylvania, and the actual transportation to Marcus Hook of 969,000 barrels of "hot" oil. The actual transportation is only a misdemeanor, but conspiracy to commit a misdemeanor is a felony punishable by a two-year prison term, or a $10,000 fine, or both.

Plead Not Guilty

Allred and Powers, the first a former district judge in East Texas, the other former assistant attorney general of Texas under James V. Allred, Renne's brother and one-time governor of Texas, pleaded not guilty when arraigned before Judge T. M. Kennerly and filed a quash motion that was upheld. In May the Supreme Court at Washington reversed this judgment and ordered Allred and Powers to trial. Hines, a fugitive when the indictment was returned, was never arraigned. Allred and Powers are at liberty on $2500 bond.

The government will be represented in the trial by Ben F. Foster, special assistant to Attorney General Frank Murphy. Some of the state's most prominent oil attorneys are expected to argue the defense.

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A higher Quality Finish
IN 50% LESS GROOVING TIME
with the new
WARNER & SWASEY QUICK ACTING SLIDE TOOL

A new Warner & Swasey Slide Tool made an immediate 50% time saving in grooving work at the Reeves Pulley Co., Columbus, Indiana. The work is on various types and sizes of cast iron bearing housings ranging in lots of 50 to 300 pieces. Typical examples of this work are detailed below. With the new slide tool the operator cuts grooves with less than a quarter turn of the handle, where five or six turns were required with the old style slide tool. The rigidity and smooth action of the tool allows faster feeds and produces a higher quality finish on each part.

If you have grooving operations, a new Warner & Swasey Quick Acting Slide Tool will cut your machining time. You will find complete information on this tool on page 39 of your new Warner & Swasey Turret Lathe Tool Catalog. For prices on this tool, or further information, write

Here's the new Warner & Swasey Slide Tool for fast recessing and facing cuts. An ideal tool for inside facing cuts which must have a smooth surface. A large micrometer dial makes adjustments of cutters a big time saver.

WARNER & SWASEY
Turret Lathes
Cleveland

YOU CAN TURN IT BETTER, FASTER, FOR LESS
...WITH WARNER & SWASEY TOOLS

Control

Compact Commission is polled on meeting date

Colonel Ernest O. Thompson, chairman of the Interstate Oil Compact Commission last week was polling members of the commission by letter to determine preferences as to the next meeting date. The meeting will probably be held in Michigan.

In commenting upon the report that the federal government would have representatives at compact sessions, the colonel said, "Government experts have met with us before to give us the benefit of their technical studies. We hope that they will continue to do so. I do not see how the federal government could become a member of the Compact Commission."

Federal membership in compact "fine"—maybe

Colonel Ernest O. Thompson, of Austin, chairman of the Interstate Oil Compact Commission, last week was asked to comment on reports from Washington that Secretary Ickes suggested the federal government might accept membership in the commission, in lieu of the Cole bill for federal oil control. Thompson's reply was that this might be a good idea, "If we are not getting in bed with a bear."

"It has been the custom and practice of the Interstate Oil Compact Commission to invite Bureau of Mines representatives and representatives of the Petroleum Conservation Division of the Department of Interior, to all of our compact meetings, and we have used the estimates of market demand as furnished by the Bureau of Mines religiously, as a guide in our production quota orders by the various states, which have looked upon the bureau as the most dependable source of information in this forecast; just as the people of America look to the United States Weather Bureau as the best source for weather forecasts; and just as the people of America look to the Census Bureau as the best source of information on the population of cities, towns and states; and exactly as the people look upon the Bureau of Weights and Measures as the best source of information on those subjects," Thompson continued.

"If what is meant by the suggestion in the press, coming from the interview of Secretary Ickes and Congressman Cole, is that we should avail ourselves of the government's statistical data, then that is just fine, and we welcome all the federal government engineering information and statistical data that we can get from whatever source, both from the engineering standpoint and from the standpoint of economics. This is what the compact was created for—to collect and assimiliate and convey to all of the states, through their representatives, the latest possible information on facts, circumstances, and conditions surrounding the production of oil.

"On the other hand," asserted Thompson, "if the government intends to use force or compulsion, then the greatest power of the compact will be destroyed; that is, the power of enlightened public opinion, with decisions freely arrived at by the sovereign oil producing states and such action taken by them as this advanced information would dictate.

"We may not have progressed as fast as some people would like to have us in this matter of waste prevention and conservation, but I do know that we have progressed, and we have progressed just as fast as the educational effort would allow us to do. A review and check on the progress made in the various states will convince any unbiased person that great progress has been made in conservation of oil and gas in the past four years."

Allowables

Proration difficulties are foreseen at Texas hearing

Difficulties in maintaining Texas production within market demand during December were discussed November 17 at the statewide hearing held before the Texas Railroad Commission. Although Commissioners Sadler and Smith spent several days in Washington recently, attempting to obtain an increase in the demand estimate for Texas crude made by the Bureau of Mines, the recommendation received last Friday was for 1,438,100 barrels, a reduction of 5900 barrels from the December estimate.

Senator Clint Small of Amarillo, speaking for the recently formed Independent Oil Producers Equity Association, pleaded with operators to abandon some of their requests for higher allowables. The commission said that there are some 40 of these applications on hand now, and the total Texas allowable on December 1, with present proration schedules continued, will be only 11,000 barrels below the new bureau estimate.

Small pointed out that the commission was faced on one hand by the operators asking for more oil every day, and that Secretary Ickes had told the commissioners that he did not see the need for federal control so long as Texas and the other oil producing states kept production within bureau estimates.

Another important question that came up was the aggravated pressure decline in the East Texas field, which has taken place since August 8. F. L. Patten, director of production for the commission, said that the pressure had dropped 12.74 pounds since that time, despite the fact that the field had been closed in for two weeks during September and had been shut down on several other days. He failed to find that this decline was excessive, although when cross examined by Commissioner Ernest O. Thompson, Patten admitted that the pressure drop included all of the increase that resulted from the 15-day shutdown.

The engineer insisted that the most important factor in maintaining pressures was to keep them above 755 pounds, the point at which he estimated gas would begin to come out of solution in the East Texas field.

Patten told Thompson he thought that the fact wells might go on the pump was only an economic problem, and that this was a factor secondary to keeping the gas in solution.

Patten's responses to questions put by Commissioner Jerry Sadler indicated that he did not believe it necessary to sustain the flowing life of the field any longer. This stand is radically different from that which the commission has advocated in the past, and many operators present expressed the opinion that the testimony Patten presented would have an important bearing on future orders entered for East Texas, especially if they came up in court.

The Sinclair company renewed its request for an adjustment of allowables along the west edge of the field, and the commission set a hearing for December 15 at Austin, to go into the East Texas problem once more. This hearing will probably be one of the most important that has ever been held on East Texas, especially if the line of testimony presented by Patten last week is developed in the same manner.

Every faction of the East Texas field was represented at the statewide hearing and expressed great interest in this new line of argument.

Patten also pointed out that he believed the field would be producing some 300,000 barrels daily of water by 1941, and he saw this as one of the most difficult problems the commission must solve, unless it continues to reduce oil allowables as the water production increases. Paul McDermott, speaking for the Sinclair company, urged that the commission permit operators to produce the allowable for one well from other wells on the same lease provided a good well is used for salt water injection purposes.

The highlight of the hearing was the debate between Sadler and Thompson over the propriety of the current East Texas order, a debate which was conducted through Patten as a witness.

Larger allowables asked for fields in Texas

The Texas Railroad Commission last week continued to hold hearings on applications for allowable increases in several fields.

Operators in the Old World pool, Crockett County, asked for an allowance of 40 barrels for three wells which now produce 20 barrels daily seven days each week. The increase was sought to take care of water conditions in the wells. It applied to only one lease. Armer and Armer were the applicants.

Pois and Schulz, operators of the field by the same name located in Wilbarger County, asked 100 barrels for each of three wells which are now permitted to produce 24 barrels a day. The additional oil would go to the Panhandle Refining Company at Wichita Falls, which was reported to be "not only willing but anxious to buy the additional oil."

Bishop Cattle Company asked that its seven wells in the South Government Wells field, Duval County, be ex-

[*Continued on page 42*]

A.P.I. Officers and Directors

(*Continued from Page* 13)

terms; W. L. Stewart, Jr.,* Union Oil Company of California, San Francisco, one-year term.

Rocky Mountain: T. A. Dines,* Utah Oil Refining Company, Salt Lake City, Utah, two-year term.

Central United States: D. J. Moran,* Continental Oil Company, Ponca City, Oklahoma; T. H. Barton,* Lion Oil & Refining Company, El Dorado, Arkansas; and Alexander Fraser, Shell Oil Company, St. Louis, two-year terms; L. B. Simmons,* Rock Island Refining Company, Duncan; C. M. Boggs,* Kanotex Refining Company, Arkansas City; and Roy B. Jones,* Panhandle Producing & Refining Company, Wichita Falls, one-year terms.

Eastern United States: H. R. Gallagher,* Consolidated Oil Corporation, New York; W. S. S. Rodgers,* The Texas Company, New York; Robert H. Colley,* The Atlantic Refining Company, Philadelphia, two-year terms; Charles L. Suhr,* The Pennzoil Company, Oil City, Pennsylvania; H. A. Logan,* United Refining Company, Warren, Pennsylvania; and Paul G. Blazer,* Ashland Refining Company, Ashland, Kentucky.

Marketing Group, Pacific Coast: Charles S. Jones,* Richland Oil Company of California, Los Angeles, and H. D. Collier,* Standard Oil Company of California, San Francisco, two-year terms; Reese H. Taylor, Union Oil Company of California, Los Angeles, one year.

Rocky Mountain: W. H. Ferguson,* Continental Oil Company, Denver, Colorado, one year.

Central United States: I. A. O'Shaughnessy,* Globe Oil & Refining Company, Minneapolis, Minnesota; Henry M. Dawes,* The Pure Oil Company, Chicago; and E. G. Seubert,* Standard Oil Company (Indiana), Chicago, two-year terms; K. S. Adams,* Phillips Petroleum Company, Bartlesville; W. G. Skelly,* Skelly Oil Company, Tulsa; and B. L. Majewski,* Deep Rock Oil Corporation, Chicago, one-year terms.

Eastern United States: W. T. Holliday,* Standard Oil Company (Ohio), Cleveland; E. W. Sinclair,* Consolidated Oil Corporation, New York, two-year terms; C. E. Arnott,* Socony-Vacuum Oil Company, New York; W. V. Hartmann,* Gulf Oil Corporation, Pittsburgh; and W. E. Smith,* Standard Oil Company (Kentucky), Louisville, one-year terms.

Transportation Group, Ships: J. Howard Pew,* Sun Oil Company, Philadelphia, two-year term; **Pipe Lines,** D. S. Bushnell,* Northern Group of Pipe Lines, New York, two years; and E. J. Henry,* The Atlantic Pipe Line Company, Philadelphia; and Harry Moreland,* Great Lakes Pipe Line Company, Kansas City, one-year terms; **Tank Cars,** L. J. Drake,* Union Tank Car Company, Chicago, one-year term.

Supply Group: W. M. Bovaird Bovaird Supply Company, Tulsa, and E. W. Gildart, Norvell-Wilder Company, Beaumont, Texas, two-year terms; J. A. Crawford, Republic Supply Company, Los Angeles; E. S. Dulin,* Byron-Jackson Company, Los Angeles; and Alex Walker, National Supply Company, Toledo, Ohio, one-year terms.

Natural Gas Group: N. C. McGowen,* United Gas Public Service Company, Houston, two-year term; and J. D. Creveling,* Panhandle Eastern Pipe Line Company, New York, one year.

Natural Gasoline Group: D. E. Buchanan,* Hanlon-Buchanan, Incorporated, Tulsa, two years, and W. K. Warren,* Warren Petroleum Company, Tulsa, one year.

At-large Group: C. J. Barkdull,* Standard Oil Company (Indiana), Chicago; Wirt Franklin,* Franklin Petroleum Corporation, Oklahoma City; Frank Buttram, Buttram Petroleum Corporation, Oklahoma City; R. Van der Woude,* Shell Union Oil Corporation, New York; Earle W. Webb,* Ethyl Gasoline Corporation, New York; Harry D. Frueauff,* Cities Service Company, New York; J. A. Brown,* Socony-Vacuum Oil Company, Inc., New York; William N. Davis,* Bartlesville; S. A. Guiberson, Jr.,* Guiberson Oil Company, Dallas; J. C. Hunter,* Mid-Continent Oil & Gas Association, Abilene, Texas; Charles F. Roeser,* Roeser & Pendleton, Incorporated, Fort Worth; Eric V. Weber,* Eureka Oil Company, Cincinnati, Ohio; and Jacob France,* Mid-Continent Petroleum Corporation, Tulsa, one-year terms.

E. B. Reeser,* Barnsdall Oil Company, Tulsa; T. Rieber,* The Texas Company, New York; J. F. Lucey,* Lucey Petroleum Company, Dallas; A. Jacobsen,* Amerada Petroleum Corporation, New York; B. F. Harris,* National Tube Company, Pittsburgh; J. Edgar Pew,* Sun Oil Company, Philadelphia; Frank Phillips,* Phillips Petroleum Company, Bartlesville; George A. Hill, Jr.,* Houston Oil Company of Texas, Houston; J. Frank Drake,* Gulf Oil Corporation, Pittsburgh; W. S. Farish,* Standard Oil Company (New Jersey); H. F. Sinclair,* Consolidated Oil Corporation, New York; John M. Lovejoy,* Seaboard Oil Company of Delaware, New York, two-year terms.

Distribution of Directors

Election of a complete board this year was necessitated by a change in the Institute's by-laws made at the 1938 meeting. Ordinarily, members of the board are to be elected for two-year terms, and the one-year terms this year indicate interim elections. The membership totals 110, of which 95 are elected by members of the Institute, and 15 by the board itself. Not more than three individuals connected as officer, director, or employe of any company or subsidiary may serve simultaneously. Distribution of membership follows: Production, 25; refining, 16; marketing, 15; supply, 5; transportation, 5; natural gas, 2; natural gasoline, 2; and at-large, 40. The board itself elects members to the at-large group.

The following members were elected by the board itself: W. C. Teagle,* Standard Oil Company (New Jersey), New York; E. R. Brown,* Magnolia Petroleum Company, Dallas; William F. Humphrey,* Tide Water Associated Oil Company, San Francisco; W. A. Jones,*Cities Service Company, New York; H. D. Klein,* The Texas Company, New York; L. S. Wescoat, The Pure Oil Company, Chicago; Paul Ryan, National Petroleum Company, Cleveland; and Ralph Zook, Sloan & Zook, Bradford, Pennsylvania, two-year terms; J. D. Collett,* O'Keefe & Collett, Fort Worth; E. W. Marland,* Oklahoma City; W. Floyd Clinger,* Pennsylvania Grade Crude Oil Association, Warren, Pennsylvania; Ralph K. Davies, Standard Oil Company of California, San Francisco; William Bell, Bell Brothers, Robinson, Illinois; Neal Anderson, Los Angeles; and R. W. McDowell, Mid-Continent Petroleum Company, Tulsa, one-year terms.

Pipe line and transportation problems, collapsing pressures of casing, economies in crude production and subsurface conditions occupy A.P.I. engineers

By BRAD MILLS, Associate Editor

THE Division of Production activity during the 20th annual meeting of the American Petroleum Institute, held in Chicago last week, was featured by four group session meetings that brought forth discussion of many important problems and advancements.

(1). Electrical, chemical and mechanical forces which constantly are attacking oil and gasoline pipe lines and oil well casing strings were examined in minute detail, and measures for repelling the attacks were proposed at a session on pipe line transportation problems.

(2). In another session, devoted to symposium on collapsing pressures and setting depths of casing, four papers were presented in an examination of the tremendous external pressures which oil well casing must withstand to permit successful and economical production of oil from depths sometimes exceeding 15,000 feet.

(3). Possible future economies in the production of crude oil from some fields through scientific determination of the optimum size of well holes and an accurate evaluation of the application of induced gas pressures in lifting oil from underground pools were suggested in two papers. A detailed summary of the problems involved in selecting and applying the correct protective coatings to petroleum equipment, particularly steel, was the subject of another paper. Adoption of a standard formula for rating cylindrical and tapered roller-bearings used in oil field

equipment was recommended by another Division of Production speaker.

(4). Another session was devoted to sub-surface conditions, having included discussion of obtaining accurate cores at depths of as great as 15,000 feet and a description of another device for examination of crude oil samples under conditions identical to those at the well bottom.

Abstracts of most of the Division of Production papers follow:

Internal Corrosion of Gasoline Pipe Lines

By L. C. MORRIS and W. A. SCHULZE, Phillips Petroleum Company

Experimental investigation of the causes of internal corrosion of gasoline pipe lines has shown air and aqueous treating solutions dissolve in, or mechanically entrained with, the gasoline to be the principal factors in tibercle growth and pitting of the pipe. A turbidimeter has been used for measuring the amount of aqueous solution or solids in the gasoline stream. Static, splashing, and circulating methods have been developed for studying the corrosion of pipe-line steel under a great variety of conditions. Studies have been made of the effect of: 1, volume ratio of the three phases—aqueous solution, gasoline, and air; 2, components of the three phases; 3, condition of the test specimen; 4, velocity of motion of liquids past the surface of the specimen; 5, temperature; 6, solids; and, 7, kind of gasoline. As an inhibitor for this type of corrosion, mercaptobenzothiazole has given good results in laboratory, pilot-plant, and commercial-scale tests, with concentrations of the order of 1 pound to 2 pounds per 1,000 barrels of gasoline.

Joint and Collapse Strength of API Grades H-40 and J-55 Electrically Welded Casing

By T. J. CRAWFORD, Republic Steel Corporation.

Data on tensile tests of 147 joints of API Grades H-40 and J-55 electrically welded casing, ranging in size from 4½ to 13⅜ inches outside diameter, are presented by the author. Round and sharp threads as well as short and long threads and couplings are compared. Results are correlated with those from similar tests on seamless casing presented at the 1938 annual meeting. The author demonstrated that joint strength is substantially a function of yield strength in tension of the material and is generally independent of the ultimate tensile strength of the material. A method was suggested and carried through for deriving probable maximum values for joint strength of both grades. Data also are presented covering collapse tests upon 202 specimens of Grade H-40 and J-55 electrically welded casing. It was demonstrated that there can be expected from this class of casing collapse strength at least as great as that predicted from published curve formulas for seamless casing having material of equivalent yield strength in tension.

A Rational Expression for the Critical Collapsing Pressure of Pipe Under External Pressure

By W. O. CLINEDINST, National Tube Company

In this paper the author examines the assumptions implicit in several widely-used formulas for the elastic failure of pipe under external pressure. Departures of the assumptions from actual conditions are noted. It is pointed out that the elastic equation can be extended into the plastic range by use of a reduced "modulus". Assumptions more nearly in accord with the facts throughout the plastic and elastic range are made, and an expression derived therefrom. The expression is compared with the widely-used formulas.

Oil field engineers are interested in methods of determining safe setting depths for pipe subjected to external pressure, and the conditions under which pipe is used in oil and gas wells generally are such as to cause the collapsing pressure to stress the material in the plastic range.

Effect of Varying Well-Bore Diameters in California Reservoirs

By ERNEST K. PARKS, Consultant

This discussion is an outcome of a previous paper initiating the subject of size of oil strings as a problem for consideration in the American Petroleum Institute. The present trend toward reduction of well diameters has led to inquiry as to effects of this practice. Data obtained do not furnish a solution for optimum choice, but are sufficient to indicate there is doubt that immediate savings are fully realized. A theoretical discussion accompanies facts and comments, with the conclusion that further investigation is warranted. It is shown that the effect of well size on production practice has been the primary incentive to further efforts in this study.

Cooperative Problems Involved in Cathodic Protection

By L. F. SCHERER, The Texas Pipe Line Company

Stated simply, cathodic protection is a method of preventing electrolytic corrosion by raising the potential of the soil above that of the pipe line to be protected by an amount sufficient to inhibit discharge of current to the soil. This makes the pipe line cathodic in the true sense of the word. The paper is the summation of the early history of cathodic protection in its application to the pipe line industry. Several of the serious problems now confronting the cathodic engineer are discussed in detail, the eminent hazards of liability and, involvement pointed out, and a plea that they be given consideration is voiced. The author presents a bibliography of articles published on the subject and a list of pipe line companies and counties in which they operate in the various states.

A Comparison of Methods for Estimating the Corrosivity of Soils

By K. H. LOGAN, National Bureau of Standards
and E. A. KOENIG, Magnolia Pipe Line Company

It is shown in this paper that none of the soil-corrosivity tests studied may be used in predicting the depth of the deepest pit that may occur in the neighborhood of a soil sample. However, if a soil survey is made and a representative number of samples of each soil is taken, the average corrosiveness of soil series can be determined with a reasonable degree of accuracy by any one of several tests that have been compared. Magnolia Pipe Line Company measured the deepest three pits on each joint of a 25-mile section of pipe line; identified the soils which the line traversed; and took samples of each type of soil. These samples have been tested by eight methods for determining soil corrosivity, and the results compared with the pit depths observed on the joints of pipe nearest the points where the samples were taken. No test of a single sample of soil will reliably predict the maximum pit depth that may occur near the point where the soil was sampled.

The Range of Application of Gas-Lift Methods

By E. C. BABSON, Union Oil Company of California

The author emphasizes that it is impossible to formulate universal rules for determining the ranges of application of gas-lift methods, since so many factors influence the selection of the proper production for a well. The paper presents results of an investigation of gas-lift methods conducted under the auspices of the production practice committee of the Institute's division of production. Pressure held against the formation and gas requirement are evaluated for: 1, straight gas lift; 2, plunger lift; 3, intermitters; and, 4, gas-displacement pump. Comparisons of various methods are given, and some suggestions made for application of results to actual production problems.

Protective Coatings

By C. F. RASSWEILER, E. I. duPont de Nemours and Company, Inc.

Failure to pay proper attention to any one of four factors can cause early failure of steel, regardless of the attention paid the other three factors involved. These four factors are (1) selection of material, (2) surface preparation, (3) correct application, and (4) adequate film thickness. To select the proper material it is necessary to set down the various properties that are required, and weight them according to their relative importance. To get good protective value, the paint must be applied uniformly, so as to wet the surface thoroughly, and enough paint must be used to give a thickness whose impermeability is well above the critical at which corrosion begins.

Viscosity Determination of Sub-surface Samples of Crude Oil

By PAUL G. EXLINE, Gulf Research and Development Company
and H. J. ENDEAN, Stanolind Oil and Gas Company

A rolling-ball viscosimeter has been constructed, capable of measuring the viscosities of sub-surface samples of crude oils under reservoir conditions. The instrument is amenable to routine work, and easily can be transported without adversely affecting its calibration. A method of transferring the sub-surface sample of crude into the viscosimeter is proposed, but to date the necessary experimental work has not been carried out to demonstrate the success of this method. The instrument is capable of operation over a temperature from 80 to 200° F., and a pressure range from atmospheric to 4000 pounds per square inch. A method is described of transferring a sample of gas-saturated liquid from a bottom-hole sampler to the viscosimeter tube without change in its physical characteristics.

Combining Bending and Hoop Stresses to Determine Collapsing Pressure of Oil Country Tubular Goods

By WALTER C MAIN, Youngstown Sheet and Tube Company

Within the range of casing sizes and weights, it is necessary to combine

both hoop and bending stresses to get a usable solution to the collapse problem. This paper suggests one method of doing this, using relations already derived. (In fact some of the work was done 90 years ago.) The equation suggested is complex and cumbersome; but by no means of graphic solutions, it should not place any burden on the engineers who need to use it. The paper points out the limitations of present formulas, and suggests a method whereby the two existing types of rational formulas be combined to give a result which is also rational and will apply throughout the entire range of tube proportions regularly used for casing, drill pipe, and tubing.

A Theoretical and Experimental Approach to the Problem of Collapse of Deep Well Casing

By J. L. HOLMQUIST
The National Supply Company
and A. NADAI
Westinghouse Research Laboratories

One of the most important considerations involved in the design of casing for deep oil wells is the resistance to collapse under the large hydrostatic pressures acting on the outside surface of the casing. The theory of plastic collapse of tubes under external pressure is developed, and this theory shows that the resistance to collapse depends on the shape of the stress-strain curve, among other factors. The results of open- and closed-end collapse tests on a number of steel tubes carefully machined to assure roundness and concentricity are reported. The results of a few tests on brass tubes also are reported. It is considered that the test results provide substantial confirmation of the validity of the plastic-collapse theory. The analysis shows also that in the case of elastic collapse, a small out-of-roundness does not lower the collapse pressure of the tube.

Partial Volumetric Behavior of the Lighter Paraffin Hydrocarbons in the Gas Phase

By B. H. SAGE and W. N. LACEY
California Institute of Technology

A method has been proposed for the prediction of the specific volume of complex gaseous-hydrocarbon mixtures, since the prediction of the volumetric behavior of complex gases of this type is of value in many industrial calculations. The method is tested by application to several cases for which both composition and volumetric behavior have been determined experimentally. The paper describes the experimental background associated with the method.

The Carter Pressure Core Barrel

By BEN W. SEWELL
The Carter Oil Company

The author describes in detail his design of a pressure core barrel, and suggests several general uses. It is stated that numerous practical applications and advantages of a pressure core barrel have been suggested, but that since only one phase of the problem can be attacked at once, so far little actual work has been done other than to develop the tool described. A log of the number of runs made by this core barrel is given, which indicates the ability of the barrel to recover a core under pressure sufficiently often for it to be considered a production tool, the author states.

Load Ratings for Roller Bearings

By C. R. ATHY
International Derrick and Equipment Division, International-Stacey Corporation

The adoption of a standard rating formula for roller bearings will give members of the Institute a convenient means for estimating the relative capacities of all makes of roller bearings, the author states. It is not claimed that the formula recommended in this paper will give accurate results in all cases, but it will give conservative values that are roughly comparative. By this formula the ratings are based entirely on the physical dimensions of the bearings. Various factors in the formula and tables giving speed and life conversion factors are included. Derivation of the formula also is given in detail.

Bureau of Mines—A.P.I. Pressure Core Barrel

By D. B. TALIAFERRO and R. E. HEITHECKER
United States Bureau of Mines

This report is the result of work done under a cooperative agreement between the Bureau of Mines and the American Petroleum Institute. The study of methods of determining the oil content of reservoirs under high pressure has resolved itself into three parts: (1) development of a device to cut and seal core specimens under reservoir conditions; (2) development of a method to prevent contamination of the core during coring; and (3) devel-

JUST OFF THE PRESS

GAS-LIFT PRINCIPLES AND PRACTICES

By
S. F. SHAW, E.M.
Consulting Engineer

Gas-Lift Principles and Practices is based on a series of lectures given at the Agricultural and Mechanical College of Texas on November 9 and 10, 1939, by the author as special lecturer of the Department of Petroleum Engineering.

Much of the material used in the lectures is included in this book. There are also included chapters on compressor plants and data on gas-lift operations in various fields in the United States and foreign countries.

Gas-Lift is an art, subject to rigid physical laws which are but vaguely understood, owing to the difficulty in observing all of the conditions that are operative during the time that the gas-lift is performing. The apparent simplicity of the mechanical operation of the gas-lift is misleading, and yet a close study is very important to insure the most efficient results.

CONTENTS:

Chapter I—History and Invention.
" II—General Principles Controlling Gas-Lift Operations.
" III—Lifting Efficiency.
" IV—Lift and Submergence.
" V—Pressure.
" VI—The Eductor.
" VII—Straight or Continuous Gas-Lift.
" VIII—Combination Gas-Lift Flow.
" IX—Intermittent Gas-Lift Flow.
" X—Compressor Plant Installations.
" XI—Gas-Lift Practices in Various Fields: Evangeline, La.; Russia; Rolla, Mo.; Globe, Ariz.; Cuba; Charcas, Mexico; Jermyn, Pa.; Goose Creek, Texas; Hull, Texas; Humble, Texas; Orange, Texas; Powell, Texas; Wortham, Texas; Smackover, Ark.; Tonkawa, Okla.; Burbank, Okla.; Bristow, Okla.; California.
" XII—Gas-Lift Practice in Seminole.
" XIII—Gas-Lift Practice in Oklahoma City, Okla.
" XIV—Gas-Lift Practice in Various Fields and Countries: East Texas; Corpus Christi, Texas; Argentine; Colombia; Peru; Roumania; Venezuela; Trinidad.

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opment of a method of analyzing the cores recovered. Interesting data and assembly drawings are presented. It is believed that if core contamination during coring operation (apparently the most serious problem at present) can be controlled satisfactorily, the data procured by pressure coring throughout the thickness of the reservoir in several wells systematically spaced with respect to the outlines of the field will give more accurate data regarding the oil and gas content of the entire reservoir than has been available heretofore.

Higher allowables asked for fields in Texas

[*Continued from Page 38*]

empt from the Saturday and Sunday shutdown. The wells produce from 60 to 80 percent water, the commission was told. Representatives of several other operators in the field said they would ask for the same consideration in the event the Bishop wells were exempted.

Brown and Wheeler, Incorporated, asked for an allowable of 38 barrels daily for the only well in the Hords Creek field, Goliad County. The well has an allowance of 30 barrels daily now. The oil is trucked to the Pettus Oil & Refining Company 10 miles away.

Humble Oil & Refining Company asked for an increase of 12,677 barrels daily for four of its fields in the Gulf Coast. Increases are shown in the table below:

Field	From (Barrels)	To (Barrels)
Webster, Harris Co.	10,144	15,790
Clear Lake, Harris Co.	844	1,400
Amelia, Jefferson Co.	3,424	4,270
Sugarland, Fort Bend Co.	4,594	10,263

The oil from the fields has one common characteristic. It is low cold test crude, and, in the event it cannot be procured here, the company will have to buy from Louisiana, Peru, or Colombia.

Humble presented lengthy testimony to show that the fields were well able to produce the additional oil without waste. Ralph Schilthuis, research engineer for Humble, and W. E. Hubbard, proration engineer, testified that at the present rates of production it would take from 50 to 128 years to deplete the reserves in the various fields.

Humble also asked that the allowable for the Raccoon Bend field, Austin County, be raised from 2388 to 3315 barrels daily. During the past 16 months, pressure in the field has risen 18 pounds, and, at the present rate of production, 73 years would be required to deplete the reservoir. The increase would mean an actual daily allowable of 25 barrels per well, the Humble engineers said.

Gem Oil Company asked that wells in the Livingston field, Polk County, be exempt from the Saturday and Sunday shutdown. The field has a current allowable of 2100 barrels daily, and the average allowable is 25 barrels, equivalent to the marginal allowance for wells of this depth.

The testimony showed that 60 of the 89 wells in the field produce an average of 49.5 percent water.

The commission has scheduled hearings November 22 on applications for increased allowables in the Plummer field, Bee County, and the Francitas field, Jackson County.

On November 27 the commission will hold a hearing at Austin to fix operating rules for the area around the Standard Oil Company of Texas' Casey 1 well, Section 4, Block 26, San Pedro de Charco Redondo Survey, Duval County.

A hearing on the West Ranch field, Jackson County, which had been requested by Magnolia Petroleum Company, last week was cancelled. An application for an allowable increase for the field had been made.

Special Order Issued

The commission has entered orders providing total displacement factors to be applied to gas wells in the Pickett Ridge field, Wharton County, and the Benavides field, Duval County. Under these regulations, gas wells may not produce more gas daily than is produced by that oil well in the field which produces the largest amount of gas.

Satsuma Spacing Regulated

The railroad commission has entered an order providing for standard 20-acre spacing for wells in the Satsuma field, Harris County. The maximum gas/oil ratio allowance is 5000/1, with a total displacement factor which applies to both gas wells and oil wells.

No proration plan is provided in the order for oil, but the gas wells may have as much as 80 acres assigned to them for proration purposes.

Adami Spacing Rules Asked

Five-acre spacing for wells in the new Adami field, Webb County, was requested by operators at a hearing before the Texas Railroad Commission last week. However, since straight acreage proration was advocated and a maximum of 10 acres could be assigned to one well, the final effect was 10-acre spacing.

The plan was presented by Glenda Oil Company and urged by Arkansas Fuel Oil Company.

The field produces from a sand found at 1000 feet and produces 21 gravity Mirando crude. The field is located in the northwestern part of survey 345, and four wells are completed .

The operators also asked that the allowable be increased from 25 to 50 barrels a day. Wells in the field cost $3500.

K-M-A Rules Revised

In an effort to equalize allowables assigned to narrow tracts in the bed of the Wichita River, the railroad commission last week revised its rules for the K-M-A field. The proration program provides for 10-acre units, with a maximum of 20 acres assigned to one well, but because interpretations vary as to the width of the stream, the exact amount of acreage assignable to these wells was difficult to determine. To accomplish the adjustment, the commission revised its spacing rule to include the following paragraph:

"(b) Provided, however, if a tract is so irregular in size or shape that same is not 660 feet in width at any place, although it has sufficient acreage to make one or more full proration units, each well on said tract that is not nearer than 900 feet to another well on said tract shall be assigned that proportionate part of 10 acres, as its proration unit, that the distance between said well and the well on said tract which is closest to it bears to 900 feet; . . . "

Marland-Finley Quota Cut

The commission has rescinded, effective November 15, special allowables assigned to wells in the Marland-Finley area of the Panhandle field. The reductions amounted to about 1700 barrels daily.

Last month, Danciger Oil & Refining Company asked for a hearing to present evidence to show that this area was a separate oil field. Commissioner Ernest O. Thompson, before whom the hearing was held at Amarillo, said that no evidence to this effect was presented, and it was on his recommendation that the increase granted when the hearing was called was deducted from the Panhandle allowance.

10-acre spacing asked for spot north of Ada

A 10-acre well spacing program was granted W. B. Osborn for development of Gilcrease and Cromwell sand sources north of Ada pool, Pontotoc County, Oklahoma. This supply is in Sections 26, 34 and 35 in township 5 north, range 7 east. Nine wells have been completed and are producing from Gilcrease formation from depths of 2200 feet to 2350 feet. Other wells are being drilled in this area where it is expected Cromwell sand will be productive from 2550 to 2600 feet.

Burton pool operators want 10-acre spacing

Harry Culver, Bert Shepherd, G. W. Case, Farmers Mutual Royalty Syndicate and others have filed formal petition before the Oklahoma Corporation Commission for a 10-acre spacing program in Burton pool. Wells are producing from Hunton lime at approximately 2725 feet and the common source of supply lies both in Seminole and Pottawatomie counties.

Wants 40-acre spacing for one-well pool

C. W. Titus filed formal petition before the Oklahoma Corporation Commission requesting 40-acre well spacing north of Cromwell pool, Okfuskee County, where one well has been completed. Replogle 1, C NE NE 26-11n-8e, topped Cromwell sand at 3475 feet and drilled to 3481 feet, and during October made its allowable of 75 barrels daily.

Proration defeat to be studied in California

One of the most important meetings to be held by the Central Committee of California Oil Producers is slated for November 21 in the assembly rooms of J. R. Pemberton, oil umpire.

This will be the first gathering of the group since the defeat of the Atkinson Oil Control bill at the polls November 7, and it is reported that a frank dis-

cussion on oil curtailment problems will be had by representatives of the various major and independent producers.

With the exception of 10 percent of the producers, the voluntary proration program of California has been said to be unusually successful. The current quota for the state is 599,000 barrels daily, and it is believed this figure will be retained throughout December.

East Texas pressure down under new proration plan

East Texas field pressures dropped 20 pounds from October 8 to November 8, Texas Railroad Commissioner Ernest O. Thompson said last week. That meant a drop of 37 pounds since September 8, and represented the decline since the new East Texas order was entered, fixing a top allowable of 690,000 barrels daily.

Thompson declared that the decline represented a loss of all benefits gained during the shutdown period and that pressures are now down to 1070.88 pounds average for the field.

New Mexico taxes will be subject of Dallas meeting

For consideration of the question of taxability of non-producing oil and gas leases and royalties in New Mexico, a meeting will be held at Dallas November 24 by the New Mexico steering committee of the Mid-Continent Oil & Gas Association's standing committee on state and local taxation.

G. L. Reese, Jr., district attorney of Lea County, will be among those present at the meeting.

Certificates awarded for prevention of accidents

Thirty-seven award certificates for the best accident-prevention records established by oil companies in 1938 were awarded at the A.P.I. meeting at Chicago last week. The 1938 records covering 317,000 employes of 144 companies in all branches of the industry showed a 13.4 percent decrease in injury frequency and a 4.8 percent decline in injury severity from 1937.

Recognition was given the natural gasoline divisions of three companies which had no lost-time accidents of any kind last year. Those companies were: Gulf Oil Corporation, Continental Oil Company, and Hope Construction & Refining Company.

Continental Oil Company also won one of two awards for the best 1938 safety record in all departments of the company, an average of 6254 employes having worked through the year with only 3.53 disabling injuries per million hours worked. Gilmore Oil Company, Los Angeles, was the second winner of an all-department award.

Departmental winners were, (1) refining: Standard Oil Company (Indiana), Mid-Continent Petroleum Corporation, Wadhams Oil Company, (Milwaukee), Barber Asphalt Corporation, and Stanolind Oil & Gas Company; (2) marketing, wholesale: Gilmore Oil Company, Magnolia Petroleum Company, and Texas Pacific Coal & Oil Company; (3) marketing,retail: Cities Service Company, Standard Oil Company of Nebraska, Smith Oil & Refining Company (Rockford, Illinois); (4) marketing, wholesale and retail: Continental Oil Company, Tide Water Associated Oil Company, Charleston Oil Company (Charleston, S. C.); (5) drilling: Ohio Oil Company, General Petroleum Corporation of California, Humble Oil & Refining Company, Globe Oil & Refining Company, Continental Oil Company, and Republic Production Company; (6) production: Chanslor-Canfield Midway Oil Company, Republic Production Company, and Globe Oil & Refining Company; (7) pipe line, oil: Atlantic Pipe Line Company, Stanolind Pipe Line Company, Mid-Continent Petroleum Corporation, Arkansas Natural Gas Corporation, and Lion Oil Refining Company; (8) pipe line, gas: Peoples Natural Gas Company and Panhandle Eastern Pipe Line Company; and (9) marine: Tide Water Associated Oil Company and Atlantic Refining Company.

PIPE LINE NEWS

Wasson field-Big Spring pipe line will be built

Construction of a 93-mile 6-inch welded crude line from the Wasson field, north portion of the Permian Basin of West Texas, to the Cosden Petroleum Corporation's refinery at Big Spring, is provided for in the five-year period crude sales and purchase contracts signed the past week. Claude L. McIver, resident of the Blackstone Hotel, Fort Worth, and formerly associated with independent pipe lines in the East Texas field, negotiated the contracts. Organization of a company to build and operate the pipe line was scheduled to be completed late last week.

The projected carrier is contracted to begin purchasing oil on Jauary 15, 1940. One or more 55,000-barrel tanks and gathering systems will be built in the field as protection against unavoidable delay in completing the carrier and its two booster stations.

The allowable production of a minimum of 10 wells each in the Wasson field has been contracted by the Texas Pacific Coal & Oil Company, Basin States Oil Company, Continental Oil Company, Amon G. Carter, and Honolulu Oil Corporation. Cosden Petroleum Corporation has contracted to purchase this oil for 5 years, according to Henry Zweifel, president, paying the posted price at the well plus 12½ cents per barrel to the carrier. The latter concern anticipates 5000 barrels daily deliveries, which will supplement current runs from the Howard-Glasscock county district.

McIver is negotiating with producers in the Seminole and Cedar Lakes areas, Gaines County, for the installation of lateral lines to each.

Artesia pipe line outlet capacity will be increased

Greater transportation outlet for the Artesia district, Eddy County, New Mexico, is to be provided by The Texas-New Mexico Pipe Line Company through the replacement of 22 miles of 5½-inch line with 8-inch pipe. The large diameter pipe will extend from a point near the Eddy-Lea County line, thence southeast to Lynch station, where it will connect with a 6-inch carrier. The capacity out of Artesia district will be boosted from 7,000 to 10,000 barrels daily, and will be required to keep abreast of the rapid development in the Loco Hills field. The company is salvaging its original 18½-mile 8-inch gravity line from Vacuum to Lynch station to use the pipe on the above project.

Wyoming-Utah pipe line filled for service test

Inspection is being made prior to the placing in regular service of the recently completed Utah Oil & Refining Company's 438-mile Wyoming-Utah pipe line. Operators have filled the line, which holds 150,000 barrels, and were expected to start regular service, with deliveries of around 3000 barrels daily, to the firm's Salt Lake refinery, by the end of the past week.

Gas line planned from Cotton Valley to Hope

Louisiana-Nevada Transit Corporation, headed by W. A. Delaney, of Ada, Oklahoma, and T. R. Jones, of Dallas, Texas, will construct a gas line from the Cotton Valley, Louisiana, field to Hope, Arkansas. A certificate of convenience has been received from the Arkansas Corporation Commission, and construction of the system will proceed at once. About 85 miles of 8-inch pipe, 12 miles of 6-inch pipe and 100 miles of lesser sizes have been purchased.

Pure interested in planned 450-mile gasoline line

The 450-mile gasoline pipe line to be built from Port St. Joe, Florida, to Atlanta, Georgia, previously reported to be constructed by Gulf Oil Corporation, is 50 percent owned by The Pure Oil Company. The system will be known as Southeastern Pipe Line Company, and contract has been awarded to Williams Brothers Corporation of Tulsa.

The line will consist of 8⅝-inch and 6⅝-inch pipe. The system, in addition to the main line from Port St. Joe to Atlanta, will probably consist of several laterals and may even be extended beyond that point.

Port St. Joe is on the Gulf Coast of Florida, and the line will save considerable tanker miles from Texas refineries.

Paraffin Trouble?

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If paraffin is one of your production problems, you need the services of Associated Engineers. We specialize in paraffin removal from wells, utilizing the newest and best equipment available. Our operators are thoroughly experienced graduate engineers.

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MEN IN THE INDUSTRY'S NEWS

CHIEF ENGINEER OF ATLANTIC REFINING COMPANY TO BE AWARDED MEDAL FOR OUTSTANDING MECHANICAL ENGINEERING PAPER

LESTER M. GOLDSMITH WILL BE HONORED BY ENGINEERS FOR MANUSCRIPT ON OIL TANKER

LESTER M. GOLDSMITH, chief engineer of Atlantic Refining Company, on December 6 at the annual meeting of the American Society of Mechanical Engineers will be awarded the Melville medal for original work, for the best original paper on any mechanical engineering subject presented to the society for discussion and publication. This will be the first occasion on which the medal will be awarded for a paper on any subject in the field of naval engineering.

The award to Goldsmith is in recognition of his paper on "The High Pressure—High Temperature Turbine Electric Steam Ship, the 'J. W. Van Dyke,' " the 18,100-ton welded oil tanker added to the Atlantic Refining Company's fleet in 1938. The paper was read by Goldsmith at the 1938 annual meeting of the Society of Mechanical Engineers.

When it was added to the Atlantic fleet, the "J. W. Van Dyke" was the world's largest welded ship, a distinction now shared with two sister ships of the same fleet, the S. S. "Robert H. Colley" and the S. S. "E. J. Henry."

Goldsmith has been with Atlantic Refining Company since two years after his graduation in 1914 from the Drexel Institute of Technology at Philadelphia, as an electrical engineer. He began as a mechanical draftsman, and subsequently served as experimental engineer, engineer of tests, technical assistant to the president, and consulting engineer. In 1934 he was appointed manager of the company's general engineering and construction department. He was appointed chief engineer in 1937.

LESTER M. GOLDSMITH

JOE S. BRIDWELL, president of Bridwell Oil Company, Wichita Falls, has announced plans for company employes and those engaged on his North Texas ranch to share in the profits of operations to be conducted by Bridwell Employes Oil Company, which will be capitalized at $25,000. The 89 eligible employes, with 3 years or more service, will be issued stock in the new enterprise on a basis of 75 per cent for length of service and 25 per cent on current wages. Bridwell has donated a 400-acre lease, virtually proved for shallow oil production, in the Adami pool, Southwest Texas, for the initial operations by the company.

JOSEPH C. TREES, member of the famous wildcatting partnership of Benedum and Trees, was honored November 10 at a party in Pittsburgh's William Penn Hotel in celebration of his 70th birthday. Also honored was his partner, who was 70 last June. Representatives of civic, social, cultural and charitable organizations rose in turn to attest the high esteem which these two men have attracted through their 50-year partnership.

H. C. COCKBURN, Houston oil man, has submitted a request to the Harris County, Texas district court that he be granted a 50-year franchise and permit to build a $5,500,000 toll tunnel under the Houston-Galveston ship channel connecting the Baytown area with U. S. highway 146 near Galveston. The proposed tunnel would accommodate 70,000 vehicles daily and trunk wire and pipe lines. Associated with Cockburn in the plan is Nick F. Helmer, New York contractor who built the Huey Long bridge across the Mississippi.

ALBERT GREGERSEN, of The Texas Company, last week at Los Angeles was elected president of the Pacific Coast section of the American Association of Petroleum Geologists for the coming year. Ed Bartosh, of Bankline Oil Company, was made secretary-treasurer. James Hammill meanwhile was elected president of the Pacific section of the Society of Paleontologists and Mineralogists.

C. E. JESTER, payroll accountant for Continental Oil Company at Ponca City, Oklahoma, has been named office manager in Houston and will occupy quarters in the company's new building. Jester has been with Continental since 1926, the date of his graduation from Kansas University Law School.

MONROE G. CHANEY, president of Anzac Oil Corporation, Coleman, Texas, departed last week on a business mission to points in the Middlewest and East. He will attend a stockholders' meeting of the company at Franklinville, New York, late this month.

HOWARD HUGHES, owner of Hughes Tool Company, has been awarded the Collier aviation trophy for the advances in aerial navigation, engineering, and communications brought about by his round-the-world flight.

JOHN R. SUMAN, vice-president of Humble Oil & Refining Company, Houston, will outline the essentials for an effective industrial relations program at the Texas Personnel Conference at Austin November 24. The conference, first of its kind attempted in Texas, will consist of discussion on personnel and industrial relations problems.

E. JARED GANN, formerly with Red Bank Oil Company, and D. A. Snyder have formed Independent Operator's Service Company, with offices in the Sterling Building, Houston. The company is unique in that its purpose is the handling of detailed forms and reports required by the railroad commission from independent operators.

J. T. BERTRAND, 64, Houston oil man, died November 14. Bertrand, a descendant of Napoleon's Marshall Bertrand, got out of the lumber business and into the oil business in 1933, investing in the Conroe field. He later acquired other Gulf coast holdings.

ALFRED VIOLETTE, of Dundee, Michigan, president of the A. V. Oil & Gas Company, died suddenly November 11. Violette came to Michigan 10 years ago, after extensive world traveling, and at Dundee "fathered" development of the Dundee oil field, the state's only Trenton lime producing area.

WILLIAM R. MITCHELL, 64, president of Mitchell-Stewart Construction Company, pipe line contractors, died November 12 in a Dallas hospital following a long illness. He was a native of Scotland, and had been active in pipe line construction work in the United States since 1907, having been associated with the late Edwin A. MacPherson before organizing the above concern.

JAMES ROBERT BLACKSTONE MOORE, 44, of Laredo, Texas, oil producer and discoverer of Lopez field of Webb County, Southwest Texas, died suddenly late November 11 while talking with friends. Before moving to Laredo for conducting development work in Southwest Texas, he was head of the land department for Vacuum Oil Company at Houston before Vacuum's merger with Magnolia Petroleum Company. Moore was a native of Heber Springs, Arkansas.

Markets generally firm and prices remain same

The markets have continued generally firm, with prices of products as well as crude oil mostly unchanged, although some shading of gasoline tank car prices has developed in the Middle West.

The markets apparently are reacting sensitively to the demand and inventory situation. Prices of lubricants and heating oils continue strong, with demand good and supplies relatively scarce. Kerosene also is firm, and industrial-grade fuel oils are steady at improved price levels; the inventories of these products being conducive to market strength. But on the other hand, continued unsteadiness of the gasoline market and the tendency of prices to sag reflect the unsatisfactory situation of the inventories of that product.

Gasoline stocks have been increasing since early October, although they normally continue downward until the middle or end of November. At present they are 8.5 percent greater than at this time last year, with demand up only about 5 percent; although the relatively smaller stocks a year ago were sufficiently excessive to lead to seriously depressed prices.

Shipments of products from the Gulf Coast have been somewhat sluggish, particularly as regards exports, with the result that storage facilities have become a little crowded at some of the larger concentration points. Consequently, there is some concern over the possibility of a year-end lag in trading.

Crude Demand Brisk

Nevertheless, the brisk demand for crude in the Southwest has not abated. In East Texas, for example, a premium for spot quantities of crude available for coastal delivery is assuming the status of a routine proposition, and possibly larger bonuses will appear until the posted price is increased.

Offering some encouragement last week to crude producers as well as refiners were reports of definite plans under way for purchase of United States oil products by agents of Great Britain and France. Pending the setting up of a purchasing system and arrangement of convoys for tankers, oil shipments to Europe have been sub-normal. The belligerants are not using much oil in the current warfare, and normal consumption has been curtailed by rationing.

Some loosening up of the supplies of crude in Texas was indicated last week as being in prospect, when Lon Smith, chairman of the railroad commission, intimated at Houston that the Bureau of Mines as well as the state commission would allow for larger demand for Texas crude in connection with December allowables. Smith and Jerry Sadler, member of the railroad commission, recently appeared before the Bureau of Mines and sought to show that agency that Texas actually had larger demand than it was credited with in the November forecst.

REFINED PRICES

REFINED GASOLINE

	Range Last Week (Cents a gal.)		Late Changes from Week Before	
Oklahoma Refineries:				
62 Octane and Under	4½	4¾	...	...
63-66 Octane	4¾	5	...	...
67-69 Octane	4¾	5¼	...	...
70-72 Octane	5¼	5½	...	...
Mid-Western Tank Car:				
62 Octane and Under	4¼	4¾	...	...
63-66 Octane	4⅝	4¾	...	...
67-69 Octane	4½	5⅛	...	...
70-72 Octane	4¾	5⅜	...	...
NATURAL GASOLINE				
Grade 26-70:				
F. O. B. Group 3	4¼		...	
F. O. B. Breckenridge, Texas	4		...	...
KEROSENE				
Oklahoma Refineries:				
41-43 water white	3½	4¼	...	...
42-44 water white	3⅝	4⅝	...	...
Mid-Western Tank Car:				
41-43 water white	3½	4	...	...
42-44 water white	3⅝	4¼	...	...
FUEL OILS				
Mid-Western Tank Car:				
Range Oil	3⅜	3⅞	...	...
No. 1 Prime White	3⅜	3¾	...	...
No. 1 Straw	3¼	3⅜	...	...
No. 2 Straw	3⅛	3¼	...	...
No. 3 Straw	3	3⅛	...	...
No. 5 (per bbl.)	65		...	...
No. 6 (per bbl.)	45		...	...

High rates of operation are cause for concern

Not altogether satisfactory were the statistics on the industry's operations in the week ended November 11. Crude oil production shot upward within about 100,000 barrels of the all-time peak daily output that was reached in August. Crude runs to stills were stepped up 71,000 barrels daily. Gasoline production was increased 28,000 barrels daily, in the face of the advance of the fall season of smaller consumption. Gasoline stocks again were increased, although considerably above economic levels.

Withdrawals from stocks of both light and heavy fuel oils reflected continued difficulty in turning out enough of those oils without consequently producing surplus gasoline. Some heating oil was taken from storage, although it is customary to continue building up those stocks until the end of November, to take care of winter requirements. Inventories of residual fuel oils were drawn upon to the large extent of 2,000,000 barrels, as industrial activity of the nation continued around all-time peak levels.

Crude Production Up

United States crude oil production jumped to 3,797,200 barrels daily in the week ended November 11, according to the American Petroleum Institute, from 3,501,350 barrels a day the previous week, when Texas' prolific fields were shut in an extra day. At the new rate, the production was about 175,000 barrels a day above the estimated average daily market requirements for November, as calculated by the Bureau of Mines. The output was 17 percent greater than that in the corresponding week last year. However, scheduled extra shutdown days in Texas during the month probably will hold November total production of the nation fairly close to November total demand.

Crude oil runs to stills were increased to 3,536,000 barrels daily in the week of November 11, from 3,465,000 barrels a day the previous week. The most active week in the history of the industry was that ended October 21, when runs averaged 3,650,000 barrels daily. The November 11 week showed an increase of 11.2 percent over the corresponding week last year, when only 3,180,000 barrels of crude daily went to stills.

Gasoline Situation

Gasoline production was increased to 12,076,000 barrels in the week of November 11, an average of 1,725,000 barrels daily, or 28,000 barrels a day more than in the previous week.

Stocks of gasoline were increased from 73,262,000 to 73,271,000 barrels, and at the latter level were 8.5 percent higher than at the corresponding time last year, although gasoline demand is running only about 5 percent above last year's trend, and although the stocks a year ago were burdensome.

Fuel Oils

Inventories of gas oil and distillate fuels were reduced about 125,000 barrels in the week of November 11, in reflection of heavy demand for heating purposes, having come down to 39,333,000 barrels. The present supply of heating oil is approximately 7 percent smaller than that held a year ago, although demand is running nearly 15 percent higher.

Stocks of residual fuel oils came down within the week from 115,036,000 to 113,015,000 barrels, as large quantities were consumed at the country's factories and in moving goods by rail and boat. The supply of residual fuel oil is about 9 percent smaller than that on hand a year ago, whereas demand is running more than 10 percent higher.

Crude Oil Stocks Up

Stocks of crude oil in the United States were increased about 500,000 barrels in the week ended November 4, according to the Bureau of Mines, having risen to 230,994,000 barrels. The crude supply still was, however, only about 2,000,000 barrels above the 17½-year low that was reached in the week ended October 21, following the Mid-Continent oil field shutdowns. The present inventory is about 16 percent smaller than that held a year ago.

Crude prices increased in Michigan fields

Sohio Corporation advanced the posted price for the Columbia-Bloomingdale area, Van Buren County, from 98c to $1.03 per barrel, effective November 9. It wiped out a long standing differential between Van Buren and Kent-Allegan grades, which have brought $1.03 since October 9.

Simrall Corporation also posted an advance from 82 to 85 cents for Ogemaw County grades.

Production from the areas affected represents only a small percentage of the state's total and other prices were not expected to change.

Initial postings made in California fields

Standard Oil Company of California effective October 1 initiated postings for crude oil in the Coles Levee and Richfield Western fields, Kern County, new producing areas in the San Joaquin Valley. The prices begin with $1 for 27-27.9 gravity crude and range upward by 3-cent differential for each degree of gravity to a top price of $1.61 for 46-46.9 gravity oil. These prices are slightly better than those in the Greeley and Canal fields of the same district.

Refinery planned at Mt. Vernon, Indiana

Indiana Farm Bureau Co-operative Association, Inc., announced plans last week for construction of a 2500-barrel refinery on a tract of 22 acres northwest of Mount Vernon, Indiana, at an estimated cost of $250,000. While it is proposed to use Illinois-Indiana crude, location of the plant on the Ohio river will permit barging of crude from elsewhere and offer a desirable transportation facility for refined products. Ralph Booker, assistant manager of the association's oil division, has been named refinery manager.

The Premier Oil Refining Company, which operates refineries in Texas and Louisiana, was also reported considering construction of a plant at Mount Vernon.

Crude Production

Decrease of 211,420 barrels brings United States daily average for last week to 3,576,505 barrels

UNITED STATES production of crude oil during the week ended November 18 was at an average rate of 3,576,505 barrels daily, or 211,420 barrels daily off the pace of the preceding week. A mid-week shutdown day imposed upon Texas producers brought the national total tumbling to a level 53,495 barrels below the Bureau of Mines estimate of demand for domestic crude. The 8 prorated states, in aggregate, produced 3,052,555 barrels, which was 218,870 barrels less than the preceding week and 52,214 barrels below conservation quota. This group produced 75,445 barrels daily less than recommended by the federal agency.

Texas produced 1,302,900 barrels daily during the week as it lagged 229,100 barrels on the pace of the preceding week. Output at this rate was 141,100 barrels less than the federal forecast, and 93,325 barrels less than proration pace.

California out-turn was comparable with that of the week before at 625,200 barrels, which is 26,200 barrels above self-imposed proration allotment and 29,200 barrels over the bureau.

Oklahoma production was also close to that of the week prior. At 431,005 barrels daily it was 2005 barrels over state and federal allocations, which are together at 429,000 barrels.

Louisiana yield was 269,300 barrels daily, 1475 barrels less than the week before. Bureau advice was exceeded by 10,300 barrels and conservation quota by 10,306 barrels.

Illinois output resurged to 338,400 barrels daily, gaining, for the first time in several weeks, upon the previous week. Bureau allocation was 35,400 barrels behind.

A 14,600-barrel increment to Kansas output left it at the 179,500-barrel level, where it was 10,500 barrels over the bureau and 8900 barrels in excess of state allotment.

South Texas refiner forced to purchase Louisiana oil

Inability to secure an adequate supply of Southwest Texas crude, because of proration restrictions, has forced the Southwestern Refining Company to Louisiana for crude supply. The first cargo of Louisiana crude will be lifted

United States Crude Oil Production

Estimates Compiled by THE OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Nov.)	State Allowable in Nov.	BARRELS DAILY FOR WEEK ENDED Nov. 18	Nov. 11
TEXAS—				
Texas Panhandle			78,150	73,400
North Texas			82,200	91,950
West Central Texas			27,350	34,050
West Texas			222,000	263,400
East Central Texas			86,250	90,700
East Texas Field			398,200	496,950
South Texas			195,500	234,350
Texas Gulf Coast			213,250	247,200
Total Texas	1,444,000	1,396,225*	1,302,900	1,532,000
CALIFORNIA—				
Long Beach			44,100	44,900
Santa Fe Springs			26,600	27,500
Huntington Beach			28,100	28,600
Dominguez			19,900	18,700
Ventura Avenue			36,800	34,500
Midway-Sunset			52,300	46,300
Kettleman Hills			54,000	50,500
Wilmington			85,300	85,900
Others			278,100	290,000
Total California	596,000	599,000†	625,200	626,900
OKLAHOMA—				
Oklahoma City			109,200	105,900
Seminole Area			108,920	102,875
Fitts			20,200	22,725
Others			192,685	197,975
Total Oklahoma	429,000	429,000	431,005	429,475
LOUISIANA—				
North Louisiana			66,050	65,825
South Louisiana			203,250	205,150
Total Louisiana	259,000	258,994	269,300	270,975

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Nov.)	State Allowable in Nov.	BARRELS DAILY FOR WEEK ENDED Nov. 18	Nov. 11
ILLINOIS—				
New Pools			330,500	323,500
Old Pools			7,900	8,700
Total Illinois	303,000		338,400	331,200
KANSAS—				
Burrton-Haven			12,150	10,875
Russell County			26,150	24,175
Silica			12,900	9,950
Others			128,300	119,900
Total Kansas	169,000	170,600	179,500	164,900
NEW MEXICO	111,000	111,000	111,500	114,550
EASTERN STATES—				
Pennsylvania Grade			76,250	77,450
Others, Eastern			26,950	27,050
Total Eastern States	106,000		103,200	104,500
MOUNTAIN STATES—				
Wyoming	63,000		61,250	59,350
Montana	16,000		17,100	17,100
Colorado	4,000		4,050	3,600
Total Mountain States	83,000		82,400	80,050
MICHIGAN	63,000	71,000	63,900	63,650
ARKANSAS	57,000	68,952	69,250	68,975
MISSISSIPPI			1,050	750
Total 8‡ Prorated States	3,128,000	3,104,769	3,052,555	3,271,425
Total United States	3,630,000		3,576,505	3,787,925

* Daily average, considering 11 shut-down days and various exemptions.
† Recommendation of Central Committee of California Producers.
‡ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Michigan, Arkansas.

at New Orleans November 17 for delivery at the company's Corpus Christi plant, according to Frank Sylvestre, president of Royal Petroleum Company, New York, owner of Southwestern Refining Company.

Needed Domestically

"I cannot understand why the Texas Railroad Commission forces a Corpus Christi plant to go to Louisiana for crude," Sylvestre said Tuesday. "There is no question of war contracts involved. The refined products from the crude run at our Corpus Christi subsidiary's refinery are sold in New York where we have a good business in fuel oils. We have presented our case to the railroad commission but two weeks ago the case was closed and we were unable to get crude.

"The plant at Corpus Christi has a capacity of 13,000 barrels daily and up to the shutdown was running 12,000 barrels a day on Southwest Texas crude. Now we are able to get only 5050 barrels per day. So we have had to go to Louisiana. We have options on 3000 barrels per day of Louisiana crude and it looks as though we are going to have to close the options.

"But it still does not make sense to us that we should have to go to Louisiana for crude when Southwest Texas has the crude potential it does have."

Texas A. & M. to stage second conference on oil problems

Success of the first conference on problems of the petroleum industry has led the Texas A. & M. College Petroleum Engineering Department to schedule a series of such meetings.

It was decided to have Dr. Garrett Kemp, a consulting engineer of Dallas, and formerly supervisory geologist with the Atlantic Refining Company to conduct a conference on the development of geophysics in April, 1940, here at the college.

This meeting will be primarily for production engineers and geologists who are not too familiar with this important subject. Dr. Kemp formerly served as professor of physics at Illinois and Purdue Universities.

The first conference was held at College Station November 9-11 on the subject of gas lift production methods under the direction of S. F. Shaw, petroleum engineer of San Antonio. The lectures conformed closely to Shaw's new book, "Gas Lift Principles and Practices," and a series of open forums were devoted primarily to gas lifting under proration conditions that usually require use of special equipment.

Approximately 100 engineers representing 45 different concerns engaged in various phases of the petroleum industry attended and a number of the firms represented sponsored displays and working models of equipment. Some 90 members of the petroleum engineering classes at A. & M. attended the sessions.

Comparison of Permits Granted for New Wells

STATE	Week Ending Nov. 18	Total this Mo.	Total this Year	Total this Date Last Year	1938 Year Total
Arkansas	1	14	203	223	247
California	45	106	989	1,053	1,146
*Illinois	68	251	*371	.....	.....
Louisiana	39	108	1,267	1,124	1,214
Kansas	24	89	1,391	1,369	1,453
Michigan	28	105	1,304	852	953
*N. Mex.	7	34	*220	.....	.....
Oklahoma	43	144	1,846	1,826	1,978
Texas	225	642	9,210	11,397	12,369
Total	480	1,493	16,750	17,844	19,360

*Data for Illinois dates from Oct. 15, 1939; that for New Mexico from Aug. 1, 1939.

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1937:						
August 28	[5]3,731,450	3,425,000	309,506,000	66,997,000	112,111,000	
September 25	3,666,300	[5]3,455,000	307,974,000	65,620,000	116,472,000	
1938:						
March 19	3,433,550	3,080,000	306,380,000	[1]93,192,000	122,067,000	
August 27	3,388,500	3,255,000	285,029,000	71,754,000	29,747,000	117,179,000
September 24	3,251,150	3,220,000	280,278,000	68,605,000	31,183,000	119,285,000
October 29	3,237,500	3,145,000	275,824,000	67,590,000	33,690,000	120,029,000
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
November 26	3,260,900	3,295,000	270,563,000	68,628,000	33,749,000	119,885,000
December 10	3,245,100	3,150,000	[2]269,509,000	68,587,000	32,068,000	118,711,000
December 31	3,201,450	3,115,000	273,024,000	71,695,000	29,082,000	115,741,000
1939:						
January 28	3,248,250	3,235,000	271,763,000	77,279,000	26,583,000	112,766,000
February 25	3,328,850	3,185,000	271,758,000	84,597,000	23,419,000	110,252,000
March 25	3,382,350	3,225,000	273,915,000	87,561,000	21,487,000	107,551,000
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,058,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
May 27	3,585,250	3,405,000	278,289,000	84,152,000	26,992,000	109,383,000
June 24	3,452,800	3,430,000	272,297,000	81,733,000	30,239,000	111,723,000
July 29	3,539,100	3,460,000	268,513,000	77,887,000	34,900,000	114,053,000
August 5	[1]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[10]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
September 30	3,658,200	3,560,000	233,023,000	71,168,000	38,081,000	115,466,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[3]3,650,000	[3]229,127,000	72,122,000	39,358,000	115,060,000
October 28	3,498,500	3,520,000	230,453,000	72,660,000	39,562,000	114,786,000
November 4	3,501,350	3,465,000	230,994,000	73,262,000	39,460,000	115,036,000
November 11, 1939	3,797,200	3,536,000	.....	73,271,000	39,333,000	113,015,000
November 12, 1938	3,243,250	3,180,000	[4]275,2[1]7,000	67,551,000	[8]	[9]
	+17.0%	+11.2%	—16.1%	+8.5%	—5.4%	—9.8%

[1] All time peak. [2] Peak for 1939. [3] Lowest since April, 1922. [4] Stocks, November 5, 1938. [5] Peak prior to 1939. [6] Lowest for year.
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.
[8] Available data for year ago include only stocks at refineries, and not at terminals, in transit, etc., except in California. Those stocks on November 11, 1938, totaled 32,701,000 barrels and comparable stocks on November 11, 1939, totaled 30,926,000 barrels, or 5.4% less.
[9] Available data for year ago include only stocks at refineries, and not at terminals, in transit, etc., except in California. Those stocks on November 11, 1938, totaled 119,822,000 barrels, and comparable stocks on November 11, 1939, totaled 108,057,000 barrels, or 9.8% less.
[10] Lowest since October, 1922, due to the shutdown of six Mid-Continent states.

Summary of Wells Completed in the United States Week Ending November 18, 1939

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1939	Total this Date 1938
Alabama	....	....	....	....	.....	2	2
Arizona	....	....	....	....	.....	1	....
Arkansas	8	6	1	1	4,035	209	200
California	25	24	....	1	17,566	959	1,135
Colorado	....	....	....	....	.....	19	8
Florida	....	....	....	....	.....	....	....
Georgia	....	....	....	....	.....	1	1
Illinois	81	65	....	16	25,827	3,377	1,514
Indiana	14	9	2	3	2,190	243	153
Kansas	24	12	3	9	52,463	1,278	1,522
Kentucky	9	2	1	6	35	579	723
Louisiana	33	24	1	8	6,602	1,004	984
Michigan	45	27	3	15	10,678	1,336	811
Mississippi	....	....	....	....	.....	12	19
Montana	5	4	1	....	200	134	69
Nebraska	....	....	....	....	.....	1	1
New Mexico	10	8	....	2	3,366	586	481
New York	21*	21*	....	....	243	557*	617*
North Dakota	....	....	....	....	.....	....	1
Ohio	25	8	8	9	161	873	848
Oklahoma	47	28	3	16	7,030	1,842	1,916
Pennsylvania	41*	41*	....	....	58	1,377*	1,917*
South Dakota	....	....	....	....	.....	....	....
Tennessee	....	....	....	....	.....	4	2
Texas	173	115	7	51	65,977	8,536	11,196
Utah	....	....	....	....	.....	....	3
West Virginia	16	4	9	3	27	500	638
Wyoming	4	3	1	....	4,280	138	99
Total this week	581	401	40	139	200,738	23,545	24,829
Total last week	532	367	42	123	274,148	22,964	24,365
Total this year	23,545	16,092	1,707	5,749	.....	....	.....

* Includes water-input and pressure wells.

WORLD-WIDE DEVELOPMENTS

Edited by WM. V. GROSS, Associate Editor

Venezuela

Oil companies give aid in Lake Maracaibo fire

Up to the time of latest tabled reports received by Standard Oil Company (New Jersey), late last week, only 30 bodies had been recovered from the fire which burned the Lake Maracaibo stilt village of Lagunillas, Venezuela. Only 7 first-aid cases and 2 hospital ones had been reported.

Upon learning about the fire, a company official at New York telephoned to its executives in Venezuela to ascertain if every possible aid was being given to the victims and their families, and were informed that this already was being done. The company learned further that no oil company employee or member of his family had been reported lost or injured in the fire.

This information was telegraphed to Wallace E. Pratt, of the Standard Oil Company, at Chicago, where he was attending the American Petroleum Institute meeting.

Additional information in the wire received by Pratt was that the Standard Oil Company of Venezuela's fire barge had performed outstanding service in saving a large part of the village located on the shore. The portion constructed above the water of Lake Maracaibo was totally destroyed. Standard's boats succeeded in rescuing most of the persons who escaped to the outer section of the pier, and who were pushed or who jumped into the lake, while others swam to shore nearby.

The homeless, the wire stated, were being housed in the village of Ojdea, constructed by the government and the oil companies, and in various company camps. Medical departments and facilities of all companies were available to everyone from the start of the catastrophe. All refugees apparently had been provided for through the help of the oil companies, government, and friends.

Five derrick barges, working on a 24-hour basis, were aiding in clearing the wreckage and assisting in the search for bodies.

There was no fire in any of the oil company camps or properties. Neither, the report continued, was there any foundation for the rumor that rescue boats were overloaded and capsized, causing loss of life. On the contrary, many of those who jumped into the lake were saved by oil company boats.

Press accounts have attributed undue significance to reported breaks in pipe lines and the spilling of oil on the lake. Standard Oil Company was informed by its representatives that only a small pipe line break occurred, on the morning of November 13, and that it was repaired by 2 p.m. the same day. A small amount of oil was lost, but Standard's representatives did not confirm press reports that an oil film on the lake caught fire and aggravated the burning of the village and loss of life. They pointed out that of those saved, only 7 required first aid treatment, and that a pier and other adjacent installations were undamaged, proving that there was no oil fire on the surface of the lake.

Laguinillas, which is not an oil village, having been constructed prior to oil development, has long been recognized as a fire hazard, and in fact burned down in 1929 and again in 1932. The government and companies cooperated in seeking to remove the population from this location, and to that end constructed a model village known as Ojeda, a few kilometers distant.

The Venezuelan government officials and press praised oil companies' efforts to rescue survivors and to alleviate suffering.

Nicaragua

Americans get concessions in Nicaragua and Honduras

A group of Texas and California oil men, among them Charles C. Coulter, San Francisco mining engineer and geologist, have secured large oil prospecting concessions in Nicaragua and Honduras, and will start almost immediately to develop them.

Coulter revealed in a recent Houston interview as he was en route to Honduras that the combine had a lease upon the 100,000 acre hacienda of ex-President Juan Sacasa of Nicaragua, and a 500,000 acre concession in Honduras containing many live oil seeps. Coulter explained that the geology of both concessions as far as worked out, was very similar in structure, age, and placement to that in Mexico. Low taxes, no proration, attractive shallow horizons, and proximity to tidewater were the advantages that Coulter cited for the Central American prospects.

Haiti

Haitian oil concession is granted H. C. Bishop

Congress of the Republic of Haiti has just confirmed a concession of approximately three million acres to H. C. Bishop of New York. Application for the concession was made in August. Geological work on the concession will start within a month, according to Bishop who is in Chicago attending the American Petroleum Institute meeting. Indications of four structures are already known to the owner.

Under the terms of the concession, application for which was made last August, Bishop has exploratory rights for three years, by the end of which time he may exercise the right to select 10 lots of 25,000 hectares each. He will then have to drill on one lot and will pay a rental of one gourde (about 20 cents) per hectare, or approximately 8½ cents per acre. Royalty of 10 percent must be paid on production developed. The concession runs for a period of 50 years.

Bishop also owns a concession of 160,000 acres in the neighboring Republic of Santo Domingo, known as the Yaguate concession, on which Dr. Fred Plummer and Mrs. Plummer did considerable geological work during the past summer. Bishop said that he expects to do some core drilling on the concession shortly.

Mexico

Mexican oil seizure upheld in tentative court opinion

The Mexican government's right to expropriate the extensive foreign-owned oil properties in Mexico was upheld November 15 in an opinion handed down by Justice Rodolfo Asiain of the Mexican Supreme Court, although the opinion must be approved through formal vote of the whole court before becoming effective.

(Under Mexican jurisprudence, one judge prepares an opinion, which must be submitted to the court for discussion and a vote.)

Reading of the lengthy document was only partially completed on November 15, and was to be resumed on subsequent days. However, an official resume of the opinion upheld constitutionality of the practice of expropriation and of the expropriation decree in the oil case and declared that the government was obligated to compensate the companies only for capital invested for producing, processing, and handling oil.

The opinion bore an element of favor to the oil companies' cause only in stating that the authorities executing the eviction gave the decree a scope not intended for it in seizing records, accounts, and cash.

The tentative opinion, which bristled with reference to United States Supreme Court decisions, was only half-read at adjournment on the first day. Its reading was to be followed by discussion and possible argument among the five justices, then rejection, modification, or immediate concurrence. If Asiain's opinion becomes that of the court, all legal recourse is closed to the expropriated companies, which since March 18, 1938, the date of President Lazaro Cardenas' evictory decree, have fought their battle through the lower courts.

There was no announcement of when a decision could be expected.

U. S. FIELD OPERATIONS

A KINGFISHER County wildcat in Oklahoma indicated possibilities of production from Pennsylvanian lime. Kentucky activity slackened as three wildcats were plugged. Duggan and Slaughter fields in West Texas were linked. North Luby and Clara Driscoll in South Texas got new producing sands. Northeastern New Mexico, comparative stranger to oil activity, furnished a gas well. Two pay zones in the Dundee lime of Michigan's Buckeye field may start an extensive deepening program. Deepest producing well in Texas is now one in League City field on Gulf Coast; gas-distillate from 10,946 feet. St. John the Baptist Parish in the Louisiana coast is bidding for its first field. In Indiana Aux Vases saturation 2 miles from the Griffin pool indicated a large reserve. In East Texas the Chapel Hill distillate pool signaled that it may be a valuable source for future East Texas field repressuring gas. Hull-Silk in North Texas, producer of high gravity crude, was extended, while northeastern Sherman County in the Panhandle found gas production across the river from a field in Texas County, Oklahoma. California's San Joaquin Valley may furnish a field between Rio Bravo and Greeley, as a deep wildcat looks good.

Oklahoma

Kingfisher County test sprays oil and gas

Tulsa.—Spraying high-gravity oil and a large volume of gas, a Kingfisher County wildcat last week sought commercial production in Pennsylvanian lime. Anderson-Prichard Oil Corporation et al's Geis 1, C NE SW 15-18n-9w, four miles northwest of Loyal, plugged back from a contract depth of 8507 feet to 7365 feet and perforated from 7330 to 7340 feet with 52 shots. On a drill-stem test it filled 750 feet with fluid, 100 feet being 50-gravity oil and the remaining 650 feet fresh water.

Two thousand gallons of acid was run through the drill stem, and when the well was opened, 15 million cubic feet of gas was gauged with a spray of oil. Finally the well settled to a half-million cubic feet, at which it was decided to re-acidize. Oil showing also diminished.

Cromwell sand was a new gas horizon for the Calvin-Beeker area of Hughes County. Phillips Petroleum Company plugged back at Shemwell 1, C SE NW 8-5n-10e, from 5595 feet in Viola lime to 4505 feet and perforated from 4504-10 feet in Cromwell sand, where gas exceeded 38 million cubic feet, and a larger volume is expected when the hole is cleaned out. A barrel and a half of oil per hour was also showing in the drilling mud, which enhances the possibility of a new oil zone.

Johnson and Kemmitz Drilling and McGraw Oil Company cored fair showing of oil in Simpson zone at their wildcat in Marshall County, five miles southeast of Madill pool, Southern Oklahoma. Bromide dense lime of upper Simpson strata was topped at 3294 feet. A 10-foot recovery in a core from 3559 to 3572 feet revealed fine sand with black spotted oil stains and live odor, with the last three feet green shale. Bit was rotating below 3700 feet, with nothing showing. This outpost is holding unusual interest among oil operators as well as political circles. Construction of the proposed Denison dam would inundate this prospective oil area, as this test is located on the northwest edge of what will be the lake. Although many oil shows have been encountered at this test, none is believed of commercial significance. Nelf-Godfrey 1, SW SE NE 14-6s-6e is a proposed 6500-foot test.

Zephyr Drilling Company and Deep Rock Oil Corporation were drilling below 2400 feet in shale at High 1, NWc E½ NW 24-26n-2w, an important wildcat venture two miles south of Hubbard-Retta area, Kay County. Location is in the center of a 1760-acre block. An east-west fault is believed cutting a subsurface high, and this test is slated to go to Arbuckle lime, with Wilcox sand production sought south of this fault. A dry hole drilled in Section 13 disclosed a graben structure, which prompted geologists to expect an accumulation of oil on the upthrow side of the fault. Two other faults intersect this feature in a northeast-southwest trend.

Cleveland County was due another disappointment, as Arbuckle lime showed dry at Sinclair Prairie Oil Company's Ward 1, SEc 30-7n-1e, 6 miles east of Lexington. At 7700 feet the lime was first encountered with about 100 feet expected to be drilled before running an electric log. Both Kinter and Stamper sands, which produce commercially in Oklahoma City pool, failed to give shows. Simpson zone afforded the best showing at 106 barrels per day, with a gradual decrease in flow, which caused officials to decide to drill ahead.

Canadian County's lone wlidcat showed only a puff of gas from 8925 feet to 9103 feet in lower Pennsyl-

Oklahoma Completions

Company, Well and Location	Init. Prod. Bbls	Depth
Caddo—		
Stephens, Funk 3, sw se se 1-5n-9w	54	5785
Aladdin Oil et al, Trotter 1, ne sw ne sw 3-5n-9w	3037	3422
Magnolia, Hedlund 7, se se nw ne 11-5n-9w (otd 3945 ft)	20	3250
Carter—		
Ideal, Scroggins 15, se nw se se 32-3s-3w	12	1180
Shell, Tubbi 41, sw se nw nw 24-4s-3w	85	1226
Creek—		
Deep Rock, Ferris 5, sec sw 17-18n-7e (otd 2404 ft)	72	2571
Curtis, Droger 2, se sw se 20-18n-9e	6	2942
Grady—		
Sinclair-Prairie, Charleson 4, se nec se 22-5n-8w (2398 ft)	¶72	3968
Jackson—		
Vaughn, Stokes 7, c n½ se sw 11-1n-20w	*	1580
Lincoln—		
Wilcox, School Land 6, nwc se 16-14n-6e	144	3128
Murray et al, Burke 1-A, ne sw ne 20-17n-6e	25	2910
Logan—		
Amerada et al, Knight 2, ne se sw 12-17n-1w (otd 5100 ft)	13	5158
Love—		
Neff et al, Braham 1, nwc sw 35-6s-2e	*	3012
Okmulgee—		
Newman, Gates 1-A, nw nwc se 21-12n-14e	*	2836
Lambert et al, Dunn 2-A, ne nec nw 21-13n-14e	4	1648
Misener, Colbert 1-A, sw ne sw 16-14n-14e (Salt Water Disposal Well)		955
Strozier, Simms 1, nwc sw 33-16n-11e	20	2054
Osage—		
Johnson, 11, ne se nw sw 18-21n-9e	*	950
Tidewater, 1, nwc se 24-26n-4e	*	3354
Pawnee—		
Haynes, Tate 1, sec nw 9-20n-9e (otd 2100 ft)	*	2400
Brewer, Spess 2, c e½ ne 27-20n-9e	65	2052
Johnson, Finley 12, ne se ne nw 27-20n-9e	125	2053
Payne—		
Mid-Continent et al, Ramsey 12, se ne nw 18-18n-2e	*	4974
Newsom, Jones 1, nec sw 15-18n-3e	*	4254
Kirk-Green-Way, Doran 1, nwc sw 32-19n-2e	*	4851
Pontotoc—		
Pierce, Pettyjohn 1, se sw sw 1-1n-7e	28	1496
Moore, Statler 2, nw swc 34-2n-7e	¶9	1811
Simpson-Roodhouse, Hale 1, sw nw se 34-2n-7e	*	1965
Pottawatomie—		
Farmers Mutual, Waite 2, se ne nw 9-5n-5e	80	2710
I. T. I. O., Davidson 7, sw se nw 23-6n-3e (otd 3493 ft)	¶9½	3401
Trigg, Hudgon 1-B, c e½ nw ne 5-6n-5e	*	3200
Mudge, Baptiste 3, se ne ne 20-7n-4e	165	3567
Phillaine, Garrett 2, ne se nw 28-7n-4e (otd 4226 ft)	1391	4276
Sinclair Prairie, Deatherage 4, sw ne nw 28-7n-4e (otd 4162 ft)	942	4309
Alma, Youts 4, ne sw sw 28-7n-5e	138	4112
Trigg, Boyd 1, sw ne sw 28-7n-5e	30	4184
Gulf, Johnson 4, ne se nw 29-7n-5e	152	4150
Big Chief, Canfield 4, se sw sw 33-7n-5e (otd 4175 ft)	150	4252
I. T. I. O., Shobe 4, swc se 35-8n-4e (otd 4295 ft)	48	3774
Seminole—		
Shephard, Scroggins 2, nwc sw 34-7n-6e	164	2765
Kerlyn et al, Rainey 1-A, sw ne se 35-10n-5e (otd 4290 ft)	55	4057
Stephens—		
Carter, Spears "B" 3, ne se se nw 15-1s-5w	*	1200
Carter, Mag-Harley 15, sw ne nw ne 24-2s-4w	5	496
Armour et al, Nigh 3, nw se ne sw 11-2s-8w	*	2015
Pace, Woodward 2, nwc ne 14-2s-8w	*	2205
Wagoner—		
Sewell et al, Spencer 1, se sw nw 23-18n-15e	*	1049
Pearson et al, Weldon 1, swc ne 5-18n-18e	*	738

*Failures; †Junked; ¶Million cu. ft. gas.

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THE "Oilwell" TC-17 Pumping Unit provides true operating economy not only on the day of its installation but also for many years after its initial cost has been paid in trouble-free production. It is sturdily built and has all of the quality features that are usually found only in larger units intended for deep-well use. Here are a *few* of its *main* features:

Skid-type, structural-steel base, short or extended, providing clearance for the cranks even when fully counterbalanced.

Rigid, derrick-type samson post with *machined* platform for the *machined* bases of the saddle-bearing housings.

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All speed-reducer shafts fully heat-treated and mounted in tapered roller bearings.

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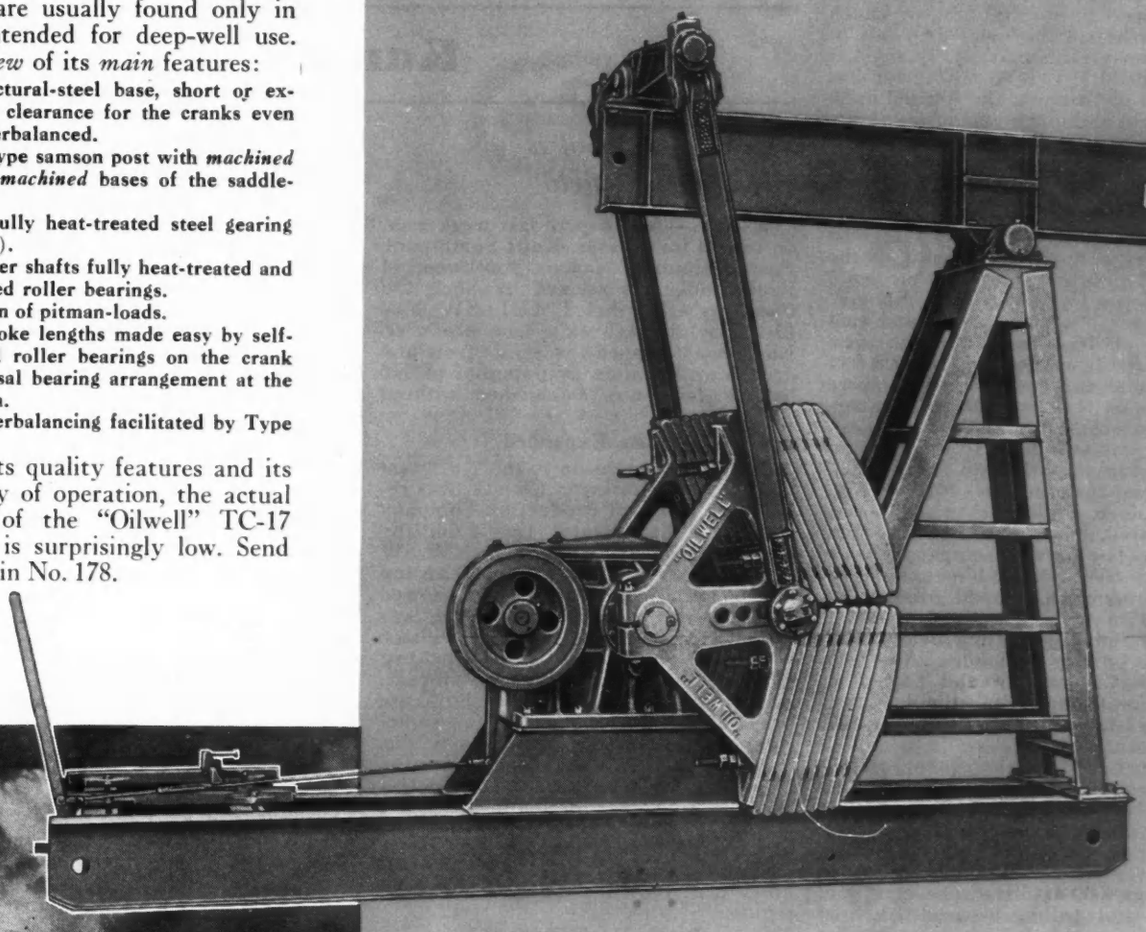
With all of its quality features and its lasting economy of operation, the actual installed cost of the "Oilwell" TC-17 Pumping Unit is surprisingly low. Send today for Bulletin No. 178.



Polished-rod load capacity (A.P.I.) . . .	(pounds)	12,800
Polished-rod strokes	(inches)	24, 32, 40, 48
Peak torque capacity at 20 s.p.m. (A.P.I.)	(inch-lbs.)	82,000
Over-all reduction ratio		32.15 : 1

OIL WELL SUPPLY COMPANY

"Oilwell"

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Elk City, Okla.—Continental Oil Company Friday stopped drilling in Proctor 1 at 14,582 feet, record depth for the state. The well will be tested.

vanian, but good porosity was indicated from an electric log. At 9191 feet a sand was topped which carried very small showings. Contract depth has been stepped up to 9500 feet, at which level it is hoped they will drill out of lower Pennsylvanian. W. R. Ramsey et al's Mansfield 1, C NW NE 16-14n-9w, northwest of Calumet, and located upon a prominent and much geologized structure, is being closely followed by Oklahoma oil men, although it looks like a duster.

Coyle Pool Defined

Coyle pool, Payne County, received its first dry hole to define limits of the area to the north. Amerada Petroleum Corporation's Hays 1, C W½ SE SW 1-17n-1e, north of production and east of a dry hole, drilled through first Wilcox sand from 4990 feet to 5008 feet without a show, and operations were shut-down at this total depth. A quarter-mile extension test to the southwest, however, was switching from rotary to standard tools to drill in. Seven-inch casing was cemented at 4812 feet in Viola lime at Helmerich and Payne, Incorporated, Berry 1, C E½ NW NE 14-17n-1e. The Texas Company's Carr 1, C W½ SW NE 12-17n-1e, east of proven production, topped Mississippi lime at 4525 feet, Woodford shale at 4600 feet, and was drilling below 4725 feet. Also on this east edge, Amerada Petroleum Corporation and Stanolind Oil and Gas Company's Fruin 4, C E½ SE NW 12-17n-1e, was in Wilcox sand at 4835 feet.

Helmerich and Payne, Incorporated were checking favorable formations structurally at LaGrange 1, NWc 8-23n-3w, northwest of Barnes pool, Garfield County. Pawhuska was topped at 2310 feet, a stray sand at 3588 feet, Layton series from 4080-4145 feet, Oswego lime 4380 feet, and drilling proceeded below 4785 feet.

Northwest extension play of Cement pool, Caddo County, may be cut short as Ray Stephens, Incorporated, drilled a dry hole to 5050 feet at McGuyr 1, NEc SW 21-6n-10w, which is to be abandoned. Sinclair Prairie Oil Company was still making hole at German 1, SW NW NW 1-6n-13w, southeast of Carnegie, below 7800 feet in lime.

A good show of gas will be tested at Phillips Petroleum Company's Warren 1, NEc SE 19-7n-17w, southwest offset to discovery well of Hobart pool, Kiowa County. Total depth is 950 feet and gas is estimated more than 3,000,000 cubic feet. At 750 feet, gas blew out and damaged the rig, and this show is reported larger than any encountered in the three other offsets.

Two new wildcat locations were staked in Jackson and Creek counties. Robinson & Jones Drilling Company was drilling below surface pipe at Neal 1, SWc 8-1s-20w, 4½ miles south of Altus pool, Jackson County. Canyon lime will be tested, after a soil analysis survey showed favorable. The operators have 3000 acres in Sections 4, 5, 6, 7, 8, 9, 16, 17 and 18-1s-20w and 1, 12 and 13-1s-21w. Adjoining acreage is held by Gulf Oil Corporation, Magnolia Petroleum Company, The Texas Company and Mid-Continent Petroleum Corporation.

A mile south of production in Heyburn pool, Creek County, Indo Oil Company staked location for Slick Estate 1, NWc 1-16n-9e. Dutcher sand produces at Heyburn pool from a faulted structure, and similar conditions are expected at this location. Layton, Dutcher, and Wilcox sands will be tested, and are expected at approximately 1300, 2900, and 3200 feet respectively.

Manahal Oil Company will drill an offset well in 23-6n-8e, near Spaulding, Hughes County, near the recent wildcat strike by Stanley Rogers, Scott 1, NE SE NW 23-6n-8e, which was completed from Booch sand at 2649-76 feet for 50 barrels daily.

Kansas

Kraft South pool is latest Kansas field

Wichita.—A new pool last week went on record for Kansas. Kraft South pool, Barton County, ⅞ mile southwest of Kraft pool, was opened by Shell Oil Company's Herthel 1, CSL SW NW 13-17-11w, an Arbuckle lime producer. Lime was topped at 3272 feet and drilled to 3291 feet. A potential of 176 barrels daily was established without acidizing.

Prusa Expanded

A 1¼-mile extension to the southwest for Prusa pool, Barton County, was reaffirmed. Aylward Production Company and Republic Natural Gas Company completed Harzman 1, C W½ NW SW 33-16-11w, from Kansas City-Lansing lime zone, after Arbuckle lime showed water. Drilled to 3356 feet, a plug was set at 3132 feet, and pay was acidized with 2300 gallons. On a 20-hour test 44 barrels of oil was run into storage. Arbuckle lime and quartzite both are productive in this pool, although somewhat erratic for the area as a whole. East of this test, Gulf Oil Corporation swabbed 4 barrels of oil and 5 of water on a 10-hour test. Riemann 1, C E½ SE SE 33-16-11w, between Prusa and Kraft pool, had Arbuckle lime from 3375 to 3384 feet. There are several dry holes scattered throughout this general region.

Brant Pool Extended

Brant pool, Butler County, was extended to the northwest. Adair and Morton had a 100-barrel producer from Mississippi lime at 2843 feet at Cannon 1, NEc NW 15-28-7e. Renewed activity is forecast for this area on completion of this test.

Helmerich and Payne, Incorporated, will shortly move in tools to drill a wildcat for Cities Service Oil Company in Sheridan County, northwestern Kansas, on a block of 30 square miles. McGinnis 1, SWc NW 10-9-27w, is 29 miles northwest of Wakeeney pool, Trego County, and nearest production. Seismograph crews shot this area thoroughly a year ago. Cities Service Oil Company is the principal acreage owner. Skelly Oil Company has some inside blocks. Lansing lime pays off around 3830 feet in the domal structure of Wakeeney pool, although Arbuckle lime will be the goal for this new venture.

Stanolind Oil and Gas Company's Siefkes 6, NEc 3-22-12w, ¼ mile northeast of production in South Sittner pool, Stafford County, acidized Arbuckle lime at 3601 feet, total depth; 6½ barrels of oil an hour was swabbed on a 3-hour test. Four miles northeast of Gates pool, Stafford County, Paul Fleeger and W. E. McPherson et al's Brown 1, SWc SE 1-21-13w, was staked for a location.

New Gas Area

A new gas spot was discovered in Jefferson County, Northeastern Kansas. E. W. Mosbacker et al's McLaughlin 1, SW NE NW 4-10-20e, six miles east of Oskaloosa and 1½ miles northeast of McLouth, tested for 2,000,000 cubic feet of gas from Bartlesville sand at 1430 feet. However, the drill was going ahead in search for oil.

Patton Drilling Company and others will drill a test 24 miles southwest of Pratt, an area heretofore untested. Hoss 1, C W½ NW SW 12-30-15w, 12 miles northwest of production in Lake City pool, is a farm out from

Kansas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Barton—		
Shell, Ehrlich "B" 5, cwl nw ne sw 1-16-14w	1314	3336
Butler—		
Richmond et al, Riddle-Walker 2, 110 ft e c se ne 3-28-4e	¶0.1	1487
Adair et al, Lychlyteer 1, c n½ nw sw 6-29-4e	*	2715
Chase—		
Kline, Breese 1, se ne sw 27-19-7e	*	725
Cowley—		
Brewer, Hughes 2, nec se 20-31-4e	*	3395
Kansas-Oklahoma, Graham 1, swc 10-32-4e	*	2342
Allred et al, Miller 1, c se sw 14-32-5e	*	748
Peringer 1, c ne nw 35-32-5e	*	680
Smith et al, Haney "B" 1, c e½ nw sw 9-33-6e	*	3526
Dickenson—		
Throp, Morse 1, nwc sw 11-13-1e	*	3262
Ellis—		
Darby, Jorgenson 6, c s½ ne sw 7-11-17w	10,200	3384
Shell, Rumsey 26, nw sw ne 23-11-17w	35,116	3390
Skelly, Koblitz 1, c e½ se ne 22-12-18w	336	3677
Greenwood—		
Reed et al, Shell Heirs 1, sw ne nw ne 17-28-11e	18	1232
Johnson—		
O. K. Supply, McCann 1, ne nwc se 15-14-22e	3	821
Marion—		
Streeter et al, Houser 1, nw nwc se 28-17-4e	150	2458
McPherson—		
Westgate-Greenland, Henne 2, c s½ se sw 18-17-1w	999	2665
Pratt—		
Skelly, Krehbiel 2, 280 ft s cwl sw se se 24-27-11w	¶55.2	4019
Rice—		
McPherson, Cramm 3, sw se nw 15-19-9w	1042	3200
Rose et al, Cross 1, nwc ne 15-20-9w	*	3282
Garden et al, Major 1, c e½ sw nw 23-21-7w	40	3425
Russell—		
Aylward, Hall 3, se sw sw 22-14-14w (otd 3030 ft)	3065	3070
Shellds, Krug 1, c n½ nw se 13-15-14w	180	3341
Woodson—		
Turner et al, Tipton 2, c n½ sw sw 32-25-14e	¶0.5	699

*Failures; †Junked; ¶Million cu. ft. gas.

Skelly Oil Company in Barber County.

Three-quarters of a mile south of production in Clark pool and north of Hittle pool, Ben Gralapp moved in a rig for Ireton 1, CEL SE NE 7-31-4e. Three other semi-wildcats were getting under way in Cowley County. Markey et al's Anderson 1, CNL E½ NW 21-30-3e, 4 miles north of Udall pool, completed cellar. It is a farm-out from Indian Territory Illuminating Oil Company. Two miles northeast of Eastman pool, Mitchell Drilling Company staked location for Bachelder 1, SWc 27-30-6e. Mission Oil Company et al's Hunt 1, SWc NE 16-34-5e, was rigging up to drill.

Outposts at Barnholdt

Barnholdt pool, Rice and McPherson counties had three outposts staked. Two miles north of production Sunray Oil Corporation started Anderson 1, CWL SW NW 17-20-5w. Fain Drilling Company was drilling at Brigs 1, CWL SW SW 21-20-5w, 1¼ miles northeast of the pool. Two miles south of Barnholdt pool, Henry Bennett et al's Petz 1, S Wc NW 8-21-5w, was a location. South of this pool E. K. Carey and Phillips Petroleum Company abandoned Ely 1, C N½ NW NW 6-21-5w, at 3375 feet in Chat, upper Mississippi, and pay horizon for the area. McPherson County reported another failure. Westgate-Greenland Oil Company abandoned McCulle 1, C E½ NE SW 29-17-1w, a southeast extension test to Roxbury pool. Hole was given up at 3194 feet in Viola lime.

North of Gardner pool, Johnson County, O. K. Supply completed a small gasser. Gardner 1, SEc NE 4-14-22e, made 180,000 cubic feet of gas daily from sand at 614-620 feet.

A Sumner County wildcat was testing for commercial oil. Slocum and Ebmeyer's McLaughlin 1, NWc 10-35-2e, two miles north of Padgett field, drilled to 3511 feet to get some oil in the hole, but plugged back to 3509 feet and had 1000 feet of fluid in the hole with a show of water.

Ellis County Test Fails

South of Walters pool, Ellis County, Emerich and others abandoned Joy 1, CWL S½ SE 14-12-18w, after considerable testing. Total depth was 3755 feet. Three-quarters of a mile west of Walters pool, Frank Hollow et al's Thomas 1, C S½ SE SE 3-12-18w, moved in a rotary derrick.

Shell Oil Company staked location for Bender 1, SWc SE 20-15-14w, three miles west of Trapp pool, Russell County. Derby Oil Company started Williams 1, C NW NE 14-20-8w, a mile south of Lyons gas area, Rice County. Two miles from Albert-Otis oil and gas pool, Piggott et al's Schneider 1, C N½ NW NW 6-18-15w, was moving in materials.

Stanolind Oil and Gas Company has a derrick for Hitz 2, C W½ SE NW 2-22-12w, ½ mile from Sittner area, Stafford County.

Tennessee

Tinsley field test logs oil sand in Selma chalk

Jackson, Miss.—Although it checked 33 feet low on top of the Selma chalk producing zone at Tinsley Dome, Jones and O'Brien's Jennie Stevens 2, C SE NE 13-10n-3w, Yazoo County, logged 23 feet of oil sand in the Selma horizon from 4560-4583 feet and drilled ahead to 5074 feet, seeking possible production in the Eutaw (Blossom) horizon, which showed oil in another test in the field.

At 5074 feet electrical log was run last week. Top of the Selma chalk was 4445 feet.

Union Producing Company's Jennie Stevens 1, C NW NW 13-10n-3w, that showed for oil production in the Eutaw and logged an oil showing in the Tuscaloosa (Woodbine), only to show salt water in the latter horizon when formation tester was run, drilled ahead at 5882 feet in hard gray sandy shale.

Two New Locations

Two new locations were made in Yazoo County, one of which is a wildcat 12 miles northeast of Tinsley Dome production. This test is Conroe-Wilcox Oil Company"s Stubblefield 1, Section 25-12n-1w, on a block of 3500 acres, four miles northeast of the town of Benton. E. G. Bradham of El Dorado, Arkansas, has contract. In the Tinsley Dome area, Tom B. Slick, Jr., was rigging at Atkinson 1, NE SW 3-10n-3w, with Red Iron Drilling Company of Tulsa having contract. Slick secured about 800 acres around this test, which is 2 miles northwest of production. The acreage adjoins several hundred acres that Slick already had leased.

Besides the tests mentioned, the Tinsley field has one other test drilling, two spudding, two rigging, and one other active location.

Wildcats Progress

G. Jeffreys' Gaddis-McLaurin 1, NW SW 17-7n-2w, Hinds County wildcat, drilled at 5890 feet in very soft coquina white lime, with no signs of mica. With elevation of 255 feet, this test topped Midway at 4652 feet and topped Selma chalk at 4956 feet, coring white chalk in calcite conglomerate. From 5120-62 feet, chalky white sand with layers of gryphea fossil casts was logged, and from 5162 to 5260 feet pure white sand calcite matrix was logged. From 5260 to 5782 feet, gray to white coquina lime of beach deposits was logged, with the next 8 feet very soft coquina lime. The next 20 feet, to 5890 feet, was very soft white coquina lime. This test is on a 15,000-acre block.

In Ittawamba County, northeast Mississippi, Gordon C. Grasty's Kentucky Lumber Company 1, NW SE 7-10s-10e, drilled ahead below 900 feet, after logging a showing of oil in lime from 560-70 feet, which will be tested if better shows do not appear at lower levels. Cleve Love's N. E. Garner 1, NE NE 1-10n-17w, Simpson County wildcat, after six months shut-down at 3150 feet in Wilcox, is reconditioning hole to deepen. It is on a 6000-acre block.

Wildcat leasing continues in various parts of Mississippi. V. E. Howze, Trustee, of Shreveport, Louisiana, secured a 25,000-acre block in Adams and Franklin counties, south Mississippi, bounded on the west by Sandy Creek and on the south by the Homochitto River and the Y. & M. V. Railroad, being in townships 5 and 6 north, ranges 1 east and 1 west. A test must be started within 60 days after January 1, 1940, and not more than 90 days after completion of first well another must be started.

C. B. Lester, of Dallas, leased 10,000 acres in townships 12 and 13, ranges 6 and 7, Sharkey County, delta section, with a 90-day drilling obligation. W. O. Allen has secured over 11,000 acres in Warren County, centering around Section 17-7n-5e; and in the same county, Sun Oil Company has checkerboarded 6000 acres across the north-central part of the county. Stanolind Oil and Gas Company has leased several hundred acres in the southwest part of township 11 north, range 2 east, Yazoo County, paying $75 per acre.

J. R. Brown has leased 4000 acres in townships 1, 2, and 3 north, ranges 10 and 11 east, Walthall County, south Mississippi. Showers and Moncrief, Incorporated, of Houston and Fort Worth, have leased several thousand acres in township 16 north, range 2 west, Humphreys County, delta section, for an immediate test. This firm secured 10,000 acres of state-owned land in the Honey Island area of this county from the Mississippi State Mineral Lease Commission last week, with the proviso to start drilling on this state land by next April 1. E. B. Germany, J. F. Lucy, F. D. Prince, and Ralph Fair secured a lease on Sections 22 to 27-18n-5e, inclusive; Sections 32 to 35 and parts of Sections 26, 31 and 36-9n-7w, Issaquena County, delta section, with a drilling proviso effective next February 1. The board continued an application of Hill and Hill of Fort Worth and W. L. Stewart for a lease on state land in Yazoo County. The board also voted at its session November 14 to continue its 40-acre spacing rule, at least until such procedure "has been proven not feasible."

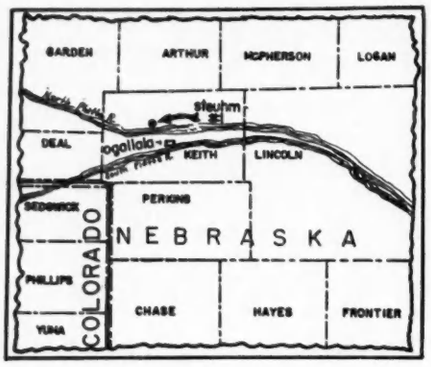
The board voted that should the first test on any block including state-owned land be a failure, the holder of the lease must drill a second test within six months, or forfeit the state-owned lease. It will also be required that a test be drilled on state property within 90 days if oil is found on a block which includes acreage leased partly from the state and partly from private interests.

Nebraska

Keith County wildcat may be Nebraska's second discovery

Omaha, Neb.—Advice to THE OIL WEEKLY late last week from Ogallala indicated that Nebraska may furnish a second producer before the first has lost its halo. California-Nebraska Oil Company's Steuhm 1, 21-14s-31w, in Keith County 8 miles northwest of Ogallala, had showings of oil and gas in the Niobrara and Fort Hayes lime that electrical logs verify as possible commercial production. According to

There is possibility that Nebraska will register a second oil strike upon the heels of its first. California-Nebraska Oil Company's Steuhm 1, wildcat in Keith County, 260 miles northwest of the pioneer production at Falls City, has logged oil and gas sands in the Niobrara and Fort Hayes, both of which are geologically younger than the Hunton lime productive near Falls City.



J. S. Kroh, a partner in the company, the hole, now at 3165 feet, will be carried through the Lakota within the next few days, and regardless of result in the Lakota, will be carried to the Sundance.

Further Exploration Afoot

Phillips Petroleum Company has moved a 15-man seismograph crew into the central Nebraska basin near Hastings. The crew will utilize log of a 4200-foot dry hole drilled in the area a year ago. Operations in this basin, stimulated by the Forest City Basin discovery, also include drilling wells near Murray and Chadron.

In the Forest City area, Pawnee Royalty Company, discoverer of the first Nebraska production with their Boice 1 near Falls City, was preparing last week to drill another well 1½ miles southwest of the discovery. J. A. Ainlay, appointed by Governor Cochran to check Pawnee's claim to the $15,000 bonus offered by the state for the first well to produce 50 barrels daily for 60 days, announced that two inspectors will be named soon to witness the test run of the Boice well.

Bert Smith 1, NW NE NW 6-5n-3e, Lone Grove Township, ¾ mile southeast of production in the St. James pool, was installing pump. Operators predicted the test would make from 75 to 100 barrels a day.

Three other wildcats in scattered parts of the basin were commanding attention. In Wayne County, Cayuna Oil Company's J. B. Brough 1, C E½ SW NE 23-1s-8e, Jasper Township, set 5½-inch casing to 3167 feet to test McClosky saturation. The wildcat, bottomed at 3167 feet, is in the center of Pure Oil Company acreage.

Shell Oil Company's Mary Dix 1, NW NE NE 19-3s-1w, near DuBois, Washington County, was waiting on cement after running casing to test 6 feet of Benoist sand saturation, topped at 1359 feet. With location at an elevation of 542 feet, the wildcat is bottomed at 1368 feet. Its successful completion would give Washington County its second oil pool, the Cordes area having been opened early in the year.

Bond Oil Company's Vogel 1, 430 feet from the north line and 1296 feet from the west line, NW 21-6n-4w, was praparing to drill plug for a test of the Devonian. The deep horizon was topped at 1818 feet, and casing was set to the top of the pay section at 1840 feet.

While waiting a pipe line connection, Paul Moseback et al's B. C. Robbin 1-B, SE SW SE 5-1n-3w, first Devonian lime well in the Bartelso pool of Clinton County, produced at the rate of 66 barrels a day for 5 days. It had been given a 500-gallon acid treatment, and is producing from 10 feet of pay topped at 2421 feet.

Confirmation of the Fairman pool on the Marion-Clinton County line was indicated with near completion of Cascade Refining Company's C. A. Adams 1, SE SE NE 13-3n-1w, Clinton County. The well was installing pump, and operators estimated initial production at 200 barrels daily. It was being completed in the Benoist sand, and was bottomed at 1445 feet.

Illinois

First Devonian producer completed in Salem pool

Mattoon. — Illinois oil history was made in the early hours of Thursday, November 16, when Kingwood Oil Company's J. O. Shanafelt 18, NW NE 20-2n-2e, in the midst of the Lake Centralia-Salem pool of Marion County, started flowing from the Devonian lime at the rate of 70 barrels an hour through 2½-inch tubing. It is the first Devonian lime production in this pool, which already accounts for 55 percent of the state's total production, and the outcome may be far-reaching in legislative circles as well as development.

The deep test, which had casing set to 3484 feet for several weeks, perforated casing opposite 40 feet of saturation, topped at 3419 feet, early in the week. Water was circulated Wednesday to clean out, after which oil was circulated through tubing until 4 p.m. Eight hours later the well kicked off. Pressure gauge on the separator was 30 pounds. At 7 a.m. Thursday, operators pinched the well in to 40 barrels an hour.

The pool is in southwestern Marion County and comprises approximately 7800 productive acres. The Texas Company holds approximately 5700 acres, Magnolia Petroleum Company about 900 acres, Ohio Oil Company about 560 acres, and Shell Oil Company about 160 acres. An additional 500 acres are held by independents, the bulk on the edge of this pool.

Deep Production Feared

It has been no secret that major companies have attempted to delay exploration of the Devonian in the pool, because of the anticipated effect a large amount of additional production would have on the crude market. One test was carried down to the deep horizon some months back, and while rumors were circulated that excellent saturation had been encountered, The Texas Company bought the well and plugged it. Authentic information on the test was never made available. Production heretofore has been taken from the Benoist, Aux Vases and the McClosky.

The Shanafelt lease is bordered by The Texas Company holdings on the north, west and south, by Magnolia holdings on the east and south, and by Ohio holdings on the southwest. While many of the small roadway, church, and school-lot tracts that forced drilling of numerous unnecessary offsets in early development of the pool have been acquired by major company holders of adjacent acreage there are still a sufficient number of tracts held by independents in scattered sections of the pool to guarantee a lively development program of the Devonian.

Observers believe that the strike, indicating a great increase in the state's proven reserves, will aid passage of a conservation measure during the special session of the state general assembly this month. As yet the session call has not been issued, but Governor Henry Horner has indicated that he was inclined to include both oil conservation and a severance tax in his call.

Other Development

On the opposite side of the Lake Centralia-Salem field, Max Pray's Cole 5, Section 16-2n-2e, was drilling below 3030 feet in shale. It is also a Devonian test.

In Fayette County, Max Conrey's

Illinois Completions

Company, Well and Location	Init. Prod. Bbls	Depth
Clay County—		
J. B. Barnes, Devore 1	3	2960
Roby Drilling Co., Dehart 1	*	2981
Pure Oil Co., A. G. Stanford 5	84	3055
Clinton County—		
Lingafelter & Williams, Harry Brough 1	*	1396
Fayette County—		
Carter Oil Co., M. E. Hogan 2	48	1562
Gerald Weaber 1	102	1623
H. O. Lewis 5	48	1572
Mary Rhodes 1	690	1589
Mable Mills 5	*	1550
Robert E. Fair 5	24	1575
Anna Tucker 4	24	1572
Tierey-Cummings 1	930	1572
Dial Durbin 1	822	1571
Irvin Hobbs 10	436	1529
Irvin Hobbs 12	376	1582
Helen Walker 7	416	1563
John Williams 4	552	1579
Elzie Owen 2	152	1571
Tom Wright 4	114	1563
Tom Wright 8	486	1573
Jacob Rhodes 2	200	1515
Mable Mills 7	162	1587
Orville Mills 2	258	1547
Raul Dunaway 4	714	1502
Robert Fair 6	169	1556
Katie Owen 4	100	1504
Katie Owen 5	56	1503
Leroy Cummings 7	816	1584
Catherine Cline 14-8	Input	1489
Mabel Mills 28-8	Input	1589
Rudco Oil Co., Tucker-Evans 2	90	1460
Jarvis Bros., Sinclair 11	230	1428
Stewart Drilling Co., Logue 1	40	1581

[Continued on next page]

Stewart Oil Co., Lucy Logue 2....	*	1577
McCloy 1	60	1600
McCloy 2	40	1587
Franklin County—		
Gulf Refining Co., U. S. Fuel Co. 2	*	4180
Jefferson County—		
Shell Oil Co., Ragan 1.....	*	3974
Carter Oil Co., Luchsinger-Hall 1..	160	1967
Lawrence County—		
Joe Kesl et al, Grace Gillespie 3...	*	1771
Marion County—		
Ohio Oil Co., C. E. Lloyd 21.....	145	1836
Magnolia Petroleum Co., S. Shanafelt 21	1680	2040
S. Shanafelt 22	1560	2020
Texas Co., C. Klienschmidt 8.....	147	2083
Friedrich Roadway 1.....	371	1855
W. Friedrich 4A	1141	2055
R. Friedrich 5	462	1870
R. Friedrich 7	287	2065
R. Friedrich 8	938	2080
W. Friedrich 13A	396	1983
W. Friedrich 14A	700	1990
W. Friedrich 15A	315	2054
L. Dunning 7	455	1968
L. Dunning 9	1071	1992
W. Friedrich 10A.....	1015	1873
L. Maxwell 2B.....	1848	1853
Maxwell 3B	1428	1859
Perry County—		
E. S. Adkins, Truax-Traer Coal Co. 1	*	1613
Wabash County—		
Gulf Refining Co., C. C. Strausser 1	200	2418
Tide Water Associated Oil Co., La-Gier 1	259	2419
D. Hawkins et al, Cowling 1.....	27	2449
W. M. Bartlett, Stansfield 2.....	200	2464
Knight & Self, H. A. Elkins 1.....	250	2488
Continental Oil Co., Phillip Schuh 1	*	2547
Myers & Witt, Shuh Roadway 1..	*	2478
F. W. Olin et al, B. & A. Shultz 1..	*	2515
Phillips Petroleum Co., Shultz 5..	365	2531
Shultz 6	340	2530
Shultz 8	519	2534
Choape & Cheny, Rosa Woodyard 1	*	2878
J. W. Carter et al, A. M. Sigert 1	*	3000
Washington County—		
Shell Oil Co., Sharkowski 4	48	1278
Wayne County—		
Illinois Mid-Continent, Cope 1....	*	3367
Puckett 2	245	3395
Sarah Harris 1	100	3485
Pure Oil Co., T. J. Hilliard 2A....	377	3304
Robinson et al, Joe Felix 1A.....	400	3403
Rock Hill Oil Co., Twist 5C.....	116	3346
Texas Co., J. Boggs 3.....	*	3502
White County—		
Kingwood Oil Co., Fearn 1	30	3170
Metcalf 1	*	3205

*Failures; †Junked; ¶Million cu. ft. gas.

Appalachian

Pennsylvania Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Bradford District:		
Pure Pen Oil, Inc., Kinley Oil Co...	5	....
Bi-State Oil Corp., Fee.....	2	....
Gem Oil Co., Fee.....	10	....
James Evans et al, Bing 423.....	2	....
H. M. Jack et al, Jack.....	2	....
Lloyd & Hardy, Meehan.....	4	....
M. Hungiville, McCullough	1	....
Bradford Transit Co., 11 wells....	11	....
Forest Oil Corp., 3 wells.....	3	....
Forest Petroleum Corp.	1	....
Niagara Oil Corp., 5 wells.....	5	....
Bradford: (Water Intake Wells)		
First Nat'l Bank, Port Allegany Fee ...	...	....
Smith Newton, Lincoln.....	...	....
Forest Oil Corp.	...	....
Forest Petroleum Corp., 2 wells....	...	....
Niagara Oil Corp., 5 wells.....	...	....
Butler-Armstrong District		
Ethridge & Pfeifer, Ira Baume....	5	....
J. M. Hilliard, J. M. Hilliard.....	2	....
Middle District		
Oil City Trust Co., Lyle.....	3½	....
Malcolm Horowitz, M. G. McFadden	1	....

New York Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Allegany County—		
Vosburg Oil Co., Green farm, Bolivar	5	1238
Liberty Share Corp., Lee farm, Bolivar	4	1359
Sawyer & Martin, Wasson farm, Bolivar	6	1352
Walter McEnroe et al, Hoover farm, Bolivar	4	1416
R. B. Moore, Wetherby farm, Bolivar	8	1388
E. G. Williams et al, Williams farm, Bolivar	10	1363
Conklin & Reeland, Swarthout farm, Bolivar	10	1356
Fred Shaner et al, So. Penn farm, Bolivar	6	1242
So. Penn farm, Bolivar.....	5	1260
Forest Oil Co., Ackerman farm, Bolivar	60	1388
Ackerman farm, Bolivar	70	1372
Ackerman farm, Bolivar	55	1380
Allegany: Water Intake Wells		
Liberty Share Corp, Lee farm, Bolivar	...	1315
R. B. Moore et al, Daggett farm, Bolivar	...	1270
Daggett farm, Bolivar.....	...	1290
L. W. Shaner et al, Northrup farm, Bolivar	...	1363
Walter McEnroe et al, Hoover farm, Bolivar	...	1390
R. B. Moore "6", Daniels farm, Bolivar	...	1280
Cowels farm, Bolivar	...	1290
Forest Oil Co., Ackerman farm, Bolivar	...	1378
Ackerman farm, Bolivar.....	...	1385

West Virginia Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Cabel County—		
C. Henderson et al, W. N. Clay 1..	¶.22	3258
Calhoun County—		
W. H. Bickel, O. V. Bigler 1.....	5	2576
Clay County—		
Virginian Gasoline & Oil Corp., Brown et al 1274.....	10	1757
Gilmer County—		
McCall Drilling Co., M Turner 1..	¶.29	1280
A. E. Ellis, Cal Pickens 2.....	¶.10	1423
Kanawha County—		
Glenn Oil & Gas Co., L. Flowers 1.	¶3.18	5381
Columbian Carbon Co., Tignor & Jordan 1.....	¶1.16	5185
H. H. Parsons 1.....	79	5092
Logan County—		
Boone Coal Co., Fee 16.....	¶.35	1950
Pleasants County—		
H. F. Simonton et al, D. O. Simonton 1.....	*	2065
Ritchie County—		
Mole Hill Oil & Gas Co., Z. Darnell 3.....	10	1132
Bine Valley Products Co., Stricker & McGinnis.....	¶.03	1885
Roane County—		
Rogers Properties Co., J. R. Cooper 1	2	1851
R. W. Healy, Jarrett Farrell 2....	¶.04	1580
Tyler County—		
Neeley Oil & Gas Co., Gorman Heirs 1	*	1665
Wayne County—		
Fairfax Oil & Gas Co., S. T. Hutchinson 1.....	*	3136

Ohio Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Athens County—		
Gross & McCune, Grant Antile 3..	20	387
Ross, Weimer & Ross, G. H. Ackley 7	5	530
Ross et al, W. Wingett 2	2	425
Columbiana County—		
C. W. Thompson et al, J. L. Pieren 2	*	720
Coshocton County—		
Preston Oil Co., R. T. Rine 2.....	50	3200
Cuyahoga County—		
Benedum-Trees, G. White 1.....	¶.70	2844
Geavga County—		
Benedum-Trees, S. L. Mather 1...	*	4313
Guernsey County—		
H. A. Burns, Muskingum Watershed 2	*	455
Hocking County—		
Joe Rubin, N. Woods 1.....	*	3033
Holmes County—		
Bell Bros., Katie Herb 2.....	¶.10	760
Licking County—		
H. L. Rexroth et al, Sam Walpole 2	3	780
Murphy & Emerald Petroleum Co., S. Swisher 3	¶.75	2612
Joe Ruben et al, H. C. Neighbarger 1	¶.15	2654
Hoover Bros., M. J. Slewart 1.....	*	2672
Lorain County—		
S. A. McFrederick et al, H. Dean 1	*	2270
Dillon & McTrederick, M. C. Strutevant 1	2	2252
Medina County—		
Preston Oil Co., R. A. Dague 6....	75	397
R. A. Dague 7	6	373
Marine Trust Co., W. A. Shaw 8	Input	459
Meigs County—		
Roy Proffitt et al, O. G. Shields 1..	*	733
Monroe County—		
George Robinson, J. Zwick 1.....	¶.13	1761
Muskingum County—		
Atha Co., G. B. Gibson 1.....	*	772
Noble County—		
J. Skinner, Brown 1	¶.10	1001
Barnsville Development Co., N. B. Grimes 1	¶	1896
Washington County—		
H. W. Winland et al, W. Winland 4	¶.14	1411

*Failures; †Junked; ¶Million cu. ft. gas.

Indiana

Aux Vases oil may make 2-mile Griffin extension

Evansville, Ind.—A 2-mile south extension to the Griffin field of Gibson and Posey counties was indicated last week, when Superior Oil Company's Mumford Realty Company 1, 1650 feet from the north line and 2970 feet from the east line, NE 31-3s-13w, set casing to test 9 feet of saturation in the Aux Vases sand. The outpost was drilled to 3047 feet, and casing set to 2796 feet. An alloy casing was set opposite the Cypress, indicating this formation would be tested later. The well is in Bethel Township, Posey County. The Aux Vases is in the Chester age, just above the McClosky.

Michel Bros.' Jasper Schloot 1, wildcat 250 feet from the south line and 250 feet from the east line, SE SE 2-5n-7w, Vigo Township, Knox County, about 9 miles north of Bicknell, reported a show of oil at 915 feet. In this same county, Gerald Johnston's A. W. Keith 1, 125 feet from the north line and 495 feet from the east line, SE SE 6-5n-9w, was abandoned at 970 feet when salt water intruded.

An east outpost to the Heusler Dome pool of Posey County, R. B. Creager and Harry Lewis, Jr.'s Strueh 1, NE SW NE 1-7s-12w, southern Marrs Township, was bailing free oil after drilling plug to the Waltersburg sand. Indicating a commercial producer, the well will be deepened about 6 feet into the sand. Casing had been set to 1728 feet.

Abandoned wildcats balanced new starts during the week, there being two of each. In Knox County, J. S. Young, Jr., and W. H. Bode's Mabes 1, NW NW NW 27-5n-8w, was plugged at 1275 feet after topping the Mississippi lime at 1209 feet. In Posey County, Al Wilhelmi et al's G. F. Zimmerman 1, 200 feet from the south line and 400 feet from the east line, SE NE SW 17-7s-14w, topped the Ste. Genevieve at 2793 feet and was abandoned at 3021 feet.

Among new starts were W. O. Allen, Jr.'s Electric Shovel Coal Co. 1, 200 feet from the south line and 1155 feet from the east line, SE 28-2s-7w, Pike County, drilling below surface casing, and Snell Trustee's Biggerstaff 1, SW SW SE 6-7s-7w, Spencer County, which had rig up. The latter test is mid-way between the Trio Oil Company's Frank Swallow 1, completed as a producer, and LeMoine & Taylor's Prudential

Indiana Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Gibson County—		
Continental, Bozeman 5.....1050		2517
Hollandsworth et al, Cooper 2.....	250	2101
Gwin Drilling Co. (Apex Drilling Co.) Julian 1.....	240	2952
Midwest, Bryant 1.....	160	1364
J. E. Amis Jr., Cooper 5.....	126	2517
Hollandworth & Bander, Cooper 20.	40	1096
Huntington County—		
Claude Drilling Co., Young 2.....	4	1037
Posey County—		
Superior, New Harmony Land Co. 11	300	2185
Haynes & Thomas, Seifert 3.....¶3.00		376
Al Wilhelmi et al's Zimmerman 1..	*	3021
Spencer County—		
R. E. Cope et al, Varner 1.....	20	1061
Sullivan County—		
A. S. Reed et al, Huff 2.....	¶.92	796
Vanderburg County—		
Sun, Kloke 1.....	*	1895
Warrick County—		
Hoosier Drilling Co., Baum 1.....	*	1630

*Failures; †Junked; ¶Million cu. ft. gas.

Life Insurance Company 1, abandoned last year after drilling through the McClosky. It is being drilled by J. Richard Snell, representing a St. Louis syndicate, L. L. LeMoine & J. Ervin Taylor and the Trio Oil Company. Arthur Grew is contractor.

Kentucky

Four wildcats in three counties are abandoned

Owensboro, Ky.—Four wildcats, scattered over 3 counties, were included among 6 Kentucky tests abandoned last week. Two small oil wells and a small gas well were also among the week's completions.

In Daviess County, Ohio Oil Company's Seay Heirs 1, 1050 feet from the west line and 1350 feet from the south line, Section 7-N-29, was plugged at 1889 feet after drilling through a dry McClosky lime section. H. C. Farmer et al's P. Moorman 1, 1001 feet from the east line and 1540 feet from the south line, Section 23-N-29, was plugged at 1440 feet.

R. H. Grant et al's Jolly 1, 1650 feet from the north line and 4000 feet from the east line, Section 10-N-35, Breckenridge County, was abandoned after being carried to 539 feet; while in Butler County, Henry & Ross' Forsythe & Neal 1, 140 feet from the south line and 4650 feet from the east line, Section 12-I-34, was abandoned at 1114 feet.

Two new wildcats were started. In Daviess County, Basin Drilling Company et al's Howard 1, 2090 feet from the north line and 1050 feet from the east line, Section 11-N-28, was drilling below 1100 feet after setting 10-inch to 839 feet. In Ohio County, Owsley et al's Davidson Heirs 1, 1500 feet from the south line and 500 feet from the west line, Section 23-N-35, was temporarily shut down at 300 feet.

Hume & Steele's T. E. Carvile 1, wildcat 4420 feet from the north line and 2150 feet from the east line, Section 8-G-34, Butler County, was drilling below 1000 feet after setting 8-inch to 880 feet.

Another closely watched wildcat, T. L. Boyce's Walker 1, 3960 feet from the east line and 520 feet from the north line, Section 10-N-24, Henderson County, was shut down at 1100 feet.

J. M. Allton, operator of Columbia, Missouri, has taken over the A. B. Vaughn 1, about 5 miles west of Clay, Webster County. The test was shut down at 900 feet.

Kentucky Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Breckenridge County—		
R. H. Grant, Jolly 1	*	539
Butler County—		
Henry & Ross, Forsythe & Neal 1	*	1114
Daviess County—		
Ohio Oil, W. F. Seay Heirs 1	*	1889
Farmer et al, P. N. Moorman 1	*	1440
Martin County—		
Virginian Gas & Oil, Federal Oil & Gas Co. V-1273	25	1287
Ohio County—		
Tuttle & Rusling, Lena Berry 4	10	161
T. M. Galey, O. L. Kirk 1	*	702
Galy & Kimmell, G. R. Wooten 1	*	2222
Pike County—		
Columbian Fuel, Mogg-Sword GW-834	¶.54	3076

*Failures; †Junked; ¶Million cu. ft. gas.

West Texas

Duggan and Slaughter fields are connected

Midland, Texas.—The linking of the Duggan and Slaughter fields, most northerly producing areas in West Texas, was assured the past week when Atlantic Refining Company's Boyd-Humble 1, SWc Labor 11, League 56, Oldham County School Lands, Cochran County, qualified as a producer.

This intermediate well swabbed 4 barrels oil hourly after using 1000 gallons of acid at 5040 feet, or 1382 feet subsea. The saturated zone is to be reacidized with 2000 gallons. The well is 2¾ miles east by south of the Duggan field, and 3¾ miles northwest of the Slaughter field, Hockley County. Boyd-Humble 1 logged top of Yates at 2960 feet and the 2 lime markers at 3960 feet and 4220 feet. These markers and the oil zone are about level with nearest producers, with no dry holes to prevent the closing of the gap.

Stanolind Oil & Gas Company's T. S. Riley 1, northeastern Gaines County wildcat and 3¼ miles north by west of its Cedar Lake pool discovery, logged top of anhydrite at 2040 feet, and was drilling at 3980 feet. The anhydrite marker places it about level with the producer. The company is drilling on 2 of the offsets to its Cedar Lake producer. Negotiations are underway for a pipe line outlet to be completed early next year, as the company is paying 23 cents per barrel for the trucking of its allowable to Humble Pipe Line Company's Means field station.

The south end of the Seminole field, Gaines County, affords a thick pay section that is comparable to that found in other sections of this major oil area. Amerada Petroleum Corporation's Averitt 1, originally completed in November, 1937, in the upper pay at 5035 feet, logged good saturation in coring to 5225 feet. Liner was cemented at 5148 feet to exclude the high gas/oil ratio production. After deepening the well flowed 46½ barrels of 34.6-gravity oil hourly through 1-inch choke natural, with 635 feet of gas per barrel. Operators in this field have unanimously agreed to avoid ficticious well potentials by taking 6-hour proration gauges through ½-inch choke, using the smallest of the first or last 3-hour period as the basis for daily rating. Amerada Petroleum Corporation's Rilev 1-A, located in the north end, logged gas-oil contact at 5063 feet, and shutdown to cement 5½-inch pipe at 5103 feet. Atlantic Refining Company's Riley 1-B, near mid-section of the field, was threatened with a crater because of blowout at 3365 feet, with high pressure air and gas coming from the Yates sand. Drill collar was accidentally lost and hung near the 1500-foot level, making it impossible to lower drill pipe to bottom and mud off the production.

Ordovician Offers Promise

Search for Ordovician production in Crockett County assumed a bright outlook when Continental Oil Company et al's J. S. Todd 1, C S½ NE SW GC&SF Section 30, Block WX, entered Simpson, or mid-Ordovician, at 6040 feet, or about 810 feet higher structurally than Stanolind et al's Todd 1, situated 1½ miles to the northeast. The new project logged oil saturation at 5993-98 feet and 6012-16 feet, but failed to yield oil on drill-stem test. It is showing a thick Simpson section, as this formation was found in coring to 6221 feet, with an elevation of 2507 feet. Location is on a 4480-acre unitized block. In southeastern Crosby County, Gulf Oil Corporation's Swenson 1-C was awaiting drill-stem test in Ellenberger at 8414 feet. Formation samples indicated water at this level. It will not

West Central Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Brown County—		
Lockwood et al, Landreth 1, sec 2	*	923
McDonald & Campbell, W. E. Hill 1	50	1314
Callahan County—		
Van Zandt et al, Johnson 1, sec 4	*	430
Shackelford County—		
Dean Bros. et al, Newell 8, sec 114	20	1442
Westexas Oil & Roy. Corp., Dawson-Conway 6, sec 193	5	1606
Stephens County—		
Horwitz & Oldom, Maury 2	1628	3575

*Failures; †Junked; ¶Million cu. ft. gas.

West Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Andrews County (Means)—		
Humble, J. S. Means 60	184	4537
J. S. Means 69	655	4534
Crane County (McCamey)—		
The Texas Co., R. King 44	341	2395
Crane County (Gulf-McElroy)—		
Gulf, J. T. McElroy 204	1255	2914
Crockett County (World-Powell)—		
Clark & Cooper, Shannon-Pure 2	*	2610
Ector County (Foster)—		
Atlantic Ref. Co., Henderson 2	738	4200
Broderick & Calvert, Witcher 14	2027	4171
Witcher 15	863	4275
Stanolind, E. F. Cowden 28-A	647	4175
E. F. Cowden 29-B	1212	4165
Ector County (Goldsmith)—		
Gulf, Goldsmith 229	1300	4216
Ector County (North Cowden)—		
Sinclair Prairie, Corrigan 8	902	4404
Stanolind, T. B. Roberts 20	284	4500
Gaines County (Wasson)—		
Amon G. Carter et al, Wasson 3-E	331	5012
Hockley County (Slaughter)—		
E. T. Marion et al, Lawless 1	621	4980
Howard County—		
Sinclair Prairie, Dodge 63	230	2795
Jones County—		
Algord Oil Co., J. C. Williams 1	2900	3277
Fain-McGaha Oil Corp., Lewis 6	775	1943
W. B. Omohundro et al, Gumm-Street 3	*	2135
Loving County (Mason)—		
Michigan O&G Co., Kyle 10	426	3922
Pecos County (Taylor-Link)—		
Landreth Prod. Corp., University 4-E	198	1645
Upton County (McCamey)—		
Shell Oil Co., Baker 13	*	2415
T. P. Coal & Oil Co., Lane 40-A	364	2051
Ward County—		
Gulf, E. W. Estes 125	1037	2670
G. W. O'Brien 118	370	2852
Winkler County (Keystone)—		
Standard Oil Co. (Texas), Baird 21-19	192	3402
Winkler County (Leck)—		
H. Adams-Hitchcock & Bradley, Leck 1-B	80	3134
Yoakum County (Wasson)—		
Aloco Oil Co., Elliott-Texaco 2	248	5225
Gulf Oil Corp., Elliott 3	134	5216
Oil Development Co. (Texas), Willard 2-801	510	5220
Skelly Oil Co., W. W. Hancock 1	1080	5234
T. P. Coal & Oil Co., Brownfield 2	1033	5175

*Failures; †Junked; ¶Million cu. ft. gas.

be carried beyond the 8500-foot contracted depth.

Magnolia Petroleum Company's Sealy 2-43, discovery test for a reef type structure in northern Ward County, logged favorable oil saturation in coring to 2978 feet, cutting small diameter hole because of having landed 5½-inch liner at 2956 feet. Production test at the latter depth after gun-perforating liner and acidizing at 2940-53 feet yielded 133 barrels oil and 7,687,000 feet of gas daily.

Phillips Petroleum Company has farmed out 2 80-acre leases adjacent to production in the Fuhrman field, Andrews County, to Haymon Krupp et al on an over-riding royalty basis. The latter is required to start development by mid-December on either the E½ SW PSL Section 25, Block 43, or N½ NW PSL Section 20, Block 42.

Ector County has been assigned a new wildcat project on a strike between the Goldsmith and Foster fields, although nearby dry holes preclude any possibility of a large producing area. Landreth Production Corporation, originally identified as sponsoring the test, has been joined by Shell Oil Company. Location is on J. L. Johnson "A" lease, SE SE NW T&P Section 43, Block 43, T-1-S. Landreth Production Corporation has added to its extensive holdings on the northeast edge of the Goldsmith field through the subleasing of 3 tracts by Humble Oil & Refining Company. The latter retained rights below 4300 feet, and 1/32 over-ride on production up to 20 barrels daily per well, and 1/16 for wells doing 20 barrels or more. Deal involves E½ SE Section 6; N½ SE Section 13, Block A; and NW SW T&P Section 21, Block 44.

Continuation of the large scale drilling program that has been underway for some months in the Wasson-Bennett district is assured now that the threat of pipe line proration has been lifted, possibly until next spring. Humble Pipe Line Company provided immediate relief the past week through the completion of loops on its Hobbs carrier. The capacity was hiked 5000 barrels to 17,000 barrels daily. A fourth outlet for the district reached the contract stage last mid-week. Claude L. McIver, Fort Worth, and associates, contracted for the allowable production of 50 wells for 5 years, with 5 property owners contributing 10 wells each. Contract to purchase this oil for 5 years at the posted price has been approved by the Cosden Petroleum Corporation for use in its refinery at Big Spring. McIver et al propose to start work shortly on a 6-inch line from Wasson to Big Spring, and are obligated to start running oil for purchase on January 15, 1940. This additional line is expected to handle 5000 barrels daily.

North Texas

Hull-Silk deep lime pay is extended southeast

Wichita Falls.—Extensions given the Hull-Silk deep lime field, Archer County, pave the way for a long drilling program that will be a factor in enabling purchasers to add to their high gravity crude requirements. The mid-section of the field was broadened ¾ mile to the southeast when Bert Ligon et al's Wilson 1-C, NWc Lot 8, Section 29, indicated a producer after coring saturation at 4340-51 feet. Nearest production is Chapman & McFarland's recent large completion in the northwest corner of Section 29. Petroleum Producers Company's Wilson-McCrory 1, ¼ mile west of the latter, is credited with having flowed into tank and pit at rate of 250 barrels hourly when tested in the lower Strawn at 4300-25 feet.

L. T. Burns and Helmerich & Payne, Inc.'s Wilmot 1, SEc lot 13, B. W. Owens-G. N. Smith Survey, became the most westerly producer in flowing 150 barrels natural in 3 hours from sandy-lime at 4376-96 feet. The performance of this well created a surprise since the oil pay is 110 feet lower structurally than Burns et al's Ahrens 5, situated 1500 feet to the east. The last 3 completions on the Ahrens lease were given nitro shots to attain flowing production. Cato Oil Company's Anderson 1, located in the most southerly southwest corner of J. S. Brooks Survey, and a probable connecting link for the Hull-Silk and Sikes areas, is showing for a small producer in lower Strawn at 4353-87 feet. Top of pay is 37 feet lower structurally than the nearest Hull-Silk well.

In southwestern Archer County, W. B. Hamilton et al's Graham 5, projected Ellenberger test, was drilling black shale at 5240 feet, having found only a thin section of chert, topped at 5210 feet. Perkins & Cullum's Falls County 183 stuck drill pipe after drilling to 5165 feet. The stem was shot off at 1800 feet as a preliminary move to remove the junk.

Nominal shows recorded at intervals have encouraged W. H. Gant and Continental Oil Company in making a deep test of the J. T. Brown 1, southwestern Montague County wildcat. Sandy-lime at 6428-31 feet carried saturation, and the test was drilling at 6450 feet. In northwestern Montague County, a 5000-foot wildcat is due to be started early in December on a block, centering about 4 miles south of Ringgold. M. T. McLaughlin and A. L. Andree assembled the block, and are credited with having made a deal with W. B. Omohundro, Wichita Falls contractor, to carry out the drilling obligation. Stanolind Oil & Gas Company purchased a lease spread at $12.50 per acre, subject to the completion of the test.

Revival of drilling in the shallow oil district in northwestern Clay County may result from the completion of E. N. Costley et al's C. T. Taylor 1-C, located ¾ mile northwest of 2 pumpers. Taylor 1-C logged broken oil sand at 1058-74 feet, and later flowed by heads when agitated. Continental Oil Company et al's Ross 1, deep lime wildcat, was drilling shale at 5070 feet.

W. B. Omohundro et al's W. T. Waggoner 1, GC&SF Section 2, half mile northwest of 3660-foot lime producer completed by Lido Oil Company in the South Vernon district, was abandoned after testing water with show of oil at 3703-50 feet. Landreth lime at 2780-98 feet also yielded water.

North Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Archer County (Hull-Silk)—		
Blackwell O&G Co., Wilson-Christie 2, lot 3	1776	4325
Continental Oil Co., Wilson-McCrory 4	1408	4341
Helmerich-Payne & Blackwell, Wilson 7	1320	4356
Bert Ligon et al, Little 1-B, sec 2	608	4327
Phillips Pet. Co., Moss 3	1152	4334
Archer County—		
Chambers & Hanks, R. O. Andrews 2, sec 1804	*	927
C. T. Hedges et al, Harmel 16-C, sec 2401	5	1278
Archer County (Wildcat)—		
Shappell Oil Co., C. E. Carter 3, sec 37	*	935
Baylor County (Seymour)—		
British-American O. P. Co., Green 3-C, sec 216	*	2850
Clay County—		
Harvey Drl. Co. et al, C. T. Taylor 3, blk 33	*	1080
Cooke County (Walnut Bend)—		
Sinclair Prairie, McGeorge 2 (pb to 5060 ft)	151	5449
Cooke County—		
M. Staniforth et al, B. Voth 2	316	1734
The Texas Co., Trubenbach 5-A	19	945
Cooke County (Wildcat)—		
Bridwell Oil Co., Joe Fisher 1	*	2131
Jack County—		
Danciger O&R, Inc., H. E. Bailey 2-A	900	4360
Jack County (Wildcat)—		
Ben Wells et al, L. Carter 1, sec 3315	*	410
Montague County (Wildcat)—		
Fisher-Holmes & Thomas, Reed-Texaco 1	*	3824
Throckmorton County—		
H. E. Bedner & Industrial Oil Co., Morrison 2, sec 1614	*	4520
Wichita County (K-M-A)—		
Bridwell Oil Co., Mangold 5, blk 34	648	3824
Fain-McGaha Oil Corp., Tidwell 1	2480	3827
J. E. Farrell et al, Waggoner Bros. 6-H, lot 9	600	3812
Felty & Harwell, Hooks 1, lot 4	336	4035
Grace & Wood, Birk 6	1112	4060
Shell Oil Co., Kempner 7-A, blk 17	536	3875
Wichita County—		
Bell O&G Co., Evans 8	52	1368
Bridwell Oil Co., Hy Willis 26 (input well)	*	1115
Magnolia, H. Reilly 158	*	1441
Geo. Proctor et al, Foster 42-A, sec 1	7	610
Mrs. Jessie Pyle et al, W. L. Warren 1, blk 32	*	878
Jas. S. Smith et al, Dodson 4	*	865
Wilbarger County—		
Lawson & Leavell, W. T. Waggoner 1-a, sec 37	44	1951
Lido Oil Co., W. T. Waggoner 22-C, sec 52	200	2760
Tom B. Medders et al, W. T. Waggoner 3, sec 45	126	2316
W. B. Omohundro et al, W. T. Waggoner 1	*	3750
Young County—		
Cable Oil Co., Snider 45	*	598
Cosden Pet. Corp., Sewell 2-B	534	3947
Holbrook & Woods, S. E. Watson 6	*	618

*Failures; †Junked; ¶Million cu. ft. gas.

Texas Panhandle

Oklahoma gas field extended into Texas

Amarillo, Texas.—Northeastern Sherman County registered its first gas production when Lawrence R. Hagy-Harrington & Marsh's Freeman 1, C NW GH&H Section 46, Block 2, tested 20,000,000 feet daily from lime at 2776-2927 feet. The test was drilling at 3100 feet, carrying small amount of salt water encountered at 2939 feet, with an elevation of 3212 feet. It involves an extension of the gas field in Texas County, Oklahoma, and paves the way for the unit-

ing of gas areas in southwestern Kansas and the Oklahoma and Texas Panhandle.

Resumption of development of the Alpha oil pool uncovered in northwestern Hutchinson County in 1934 by Humble Oil & Refining Company has accounted for 2 prospective completions, although of small caliber.

J. M. Huber et al's Jack Johnson 1, SW¼ T&NO Section 134, Block 5-T, was cleaning out after nitro shot at 3200-84 feet, having filled 200 feet with oil, natural, after plugging back from water at 3285-90 feet, with an elevation of 3322 feet. E. J. Dunigan et al's Parks 1, NWC D&P Section 1, Block R-2, was awaiting orders after testing 5 barrels fluid daily, 50 percent water, from broken lime at 3195-3295 feet. Water was encountered in the last two feet of hole.

Texas Panhandle Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Carson County—		
L. R. Hagy-Harrington & Marsh, Urbanczyk 2	¶17.8	2966
Urbanczyk 3	¶25½	2944
Gray County—		
Humble, Merton 10	355	3258
Magnolia, C. S. Barrett 8	127	3286
Shell Oil Co., McConnell 4	173	3195
The Texas Co., G. H. Saunders 31	504	2907
Hutchinson County—		
Smith Bros. Ref. Co., Hodges 4	35	3083
Travelers Oil Co., Haile 8-B	755	3035
Moore County—		
Panhandle Eastern P. L. Co., M. F. Brown 1-64	¶22¾	3238
J. T. Sneed 1-3	¶25.9	2918
J. T. Sneed 1-20	¶27.8	3135

*Failures; †Junked; ¶Million cu. ft. gas.

East Texas

Chapel Hill importance enhanced by deep test

Tyler.—The Chapel Hill gas-distillate pool, eastern Smith County, advanced a step nearer confirmation of geophysical information that points to the presence of a large structure capable of producing from the lower Trinity series. Shell Oil Company's Campbell 1, second scheduled deep test and 2½ miles northeast of the 7528-foot producer, logged top of Georgetown lime at 4393 feet, with an elevation of 449 feet. It is only 4 feet lower on structure than H. L. Hunt Oil Company's discovery. Protection string of 9⅝-inch pipe has been cemented at 4425 feet.

This area is being relied upon by large property owners in the East Texas field to become the principal

East Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Gregg County (Kilgore)—		
Sinclair Prairie, A. A. King 66-A (366.7-ac)	2000	3585
A. A. King 62-B (337.6-ac)	2400	3581
Gregg County (Longview)—		
W. L. Pickens et al, Hoyt 6 (21 ac)	3000	3548
Stewart Oil Co., Killingsworth 2 (69.9-ac)	120	3596
Anderson County (Cayuga)—		
Carter-Gragg Oil Co., Goode-Tidal 2	200	4010
C. W. McMahon 1	¶85	4025
Houston County (Navarro Crossing)—		
W. C. McGlothlin et al, Dailey-Sun 2	110	5893

*Failures; †Junked; ¶Million cu. ft. gas

source of low cost gas that will be needed later for lease operation fuel, and repressuring. The discovery company has found the lower Glen Rose production attractive, as it has produced in excess of one billion cubic feet of gas and 72,000 barrels of distillate. The well was completed in July, 1938, and began delivering gas through a short line to the East Texas field several months later.

Murray Samuell et al's Barron 1, Limestone County wildcat strike, on a secondary fault plane to the east of the Mexia displacement, tested 1,500,000 feet of gas with a spray of water white distillate, according to latest gauge through 3/32-inch tubing choke. Production is from the Pettit zone, after gun-perforating casing at 5584-5611 feet. The hole was plugged back from water in the Travis Peak after drilling to 6052 feet. On the above gauge, the well recorded 2100 pounds pressure on tubing and 2300 pounds on casing. Bottom-hole choke is to be installed, to prevent surface connection from freezing. This high-pressure gas may be marketed in the Mexia field.

Panola Wildcat Planned

Continental Oil Company, with cooperation of Pure Oil Company and Glassell, is planning a 7000-foot wildcat test on Marshall Lumber Company land in a block it has in Panola County, Texas, several miles north of 3 Glen Rose lime wet gassers completed in the Julia Soape Survey, Panola County, several months ago.

Southwest Texas

Clara Driscoll field is becoming large reserve

Corpus Christi.—Clara Driscoll field was being converted into one of the outstanding crude reserves of Nueces County, through additional extension and opening of new crude sands. One mile east of the South pool a joint operation by Wellington Oil Company of Delaware and Seaboard Oil Corporation was waiting on cement at 5440 feet after setting casing at that level. It cored sands with oil odor at 5006-13 feet and a good oil sand at 5245-73 feet. A drill-stem test on the latter zone recovered 1005 feet of pipe line oil, 270 feet of oil and mud, 90 feet of mud, and 60 feet of salt water, under 37 pounds top-hole and 1890 pounds bottom-hole pressure, in 15 minutes.

Wellington Oil Company, Drilling jointly with the Pan-American Production Corporation, has extended the North Clara Driscoll field, Nueces County, 3000 feet to the east. Casing was set after the hole had been carried to below 7700 feet and electric log made. The test had an excellent sand section at 5293-5307 feet and on drill-stem test recovered 510 feet of 24-gravity pipe line oil with 410 pounds working pressure in 15 minutes. It showed gas in the discovery pay at 3800 feet.

Seaboard Oil Corporation of Delaware's La Prelle 4, discovery of a new and deeper sand for the North Luby field, also in this county, gauged 155 barrels of pipe line oil in 24 hours through ⅛-inch choke under 450 pounds equalized pressure. It found the pay at 5073-85 feet, but completion was through perforations at 5080-84 feet.

George Greer's Ward Estate 1, about 3500 feet northeast of the West Ranch field, Jackson County, was coring below 5022 feet, reportedly in sand showing oil. It topped the discovery sand, which carried oil odor with salt water, at 5125 feet, but went ahead to the Vanderbilt zone. It is about 26 feet lower structurally than the east outpost to the field and is expected to make a producer.

Pulled on gas line, Houston Oil Company's discovery of a 4800-foot sand in the Cologne field of Victoria County, is flowing at the rate of 130 barrels of crude per day. The well is Dietzell 1, about ½ mile south of present gas production in the 2800-foot Catahoula zone. The lower sand is in the base of the Frio or at the top of the Vicksburg.

Another Calhoun County field was in the making with Continental Oil Company setting casing in Austin Estate (Powderhorn Land Corporation) 2, 15 miles east of Seadrift. The well is located in the Juan Cano League, and in Section 2, Block J, 2½ miles south of Bayside Beach. The test is bottomed at 5901 feet, with casing set at that level. A gas sand was cored at 5819-27 feet. Continental has drilled several heaving shale wells in this area. All were junked as failures.

A north extension and a new sand for the La Gloria field of Jim Wells County was in the making, with Magnolia Petroleum Company preparing to complete E. H. Stolze 1, ½ mile north of San Juan discovery, in distillate sand at 6998-7011 feet. The hole is bottomed at 7060 feet, with casing set at that level.

Southern Minerals Corporation was preparing to continue development of its large multiple sand area on the Bentonville-King structure in Nueces County, following the purchase of a 1500-acre block from the Stanolind Oil and Gas Company. The consideration was not announced, but it was understood to be mainly an overriding royalty, plus development. The tracts involved included all of fractional Sections 9 and 21, N ½ of SE ¼ Sec. 22, S ½ of Sec. 23 except a gas well in the SE ¼ of Sec. 23. The Southern Minerals Corporation has constructed a pipe line to the field from Saxet field.

Test of Sparta-Wilcox at Fordtran is encouraging

San Antonio.—Considerable interest was being shown in the Sparta-Wilcox trend of South Texas late last week, as a second operation was in the deep zone, showing oil and gas producing possibilities. It was Wellington Oil Company of Delaware's Boothe 1, on the Fordtran prospect in Victoria County. Although a drill stem test of the lower pay showed salt water, its

other indications were of sufficient importance that the district is in line for further drilling to these pays.

The Wellington well ran a drill stem test at 8950-9016 feet. Through ¼-inch chokes at top and bottom, and using 1950-foot water cushion, the well in 20 minutes yielded 400 feet of salt water, 180 feet of mud, and no pressure. It was coring ahead in search of a shale break, with the hope that another sand lens might be found carrying oil.

The well was carried to 9016 feet (revised from 9021 feet) and electric log run. The section from 8950 feet to 9016 feet was indicated as a solid sand body with the exception of several small shale breaks. The electric log further indicated considerable sand in the broken section above this level, all carrying a good kick. Casing may be set after the well is deepened for a series of tests at the upper levels in the Carrizo zone. These sands were indicated at 8759-66 feet, 8805-12 feet, 8820-80 feet, 8924-43 feet; all were broken.

Several oil sands found in Bee County wildcat

Beeville, Texas.—Coronado Corporation's Heard prospect in Bee County, about 10 miles southeast of Beeville, was looking up as the discovery of a multiple sand field November 17, as a third producing zone was tested. The new sand was at 4686-4708 feet. It showed sand at 3253-70 feet and 4428-48 feet.

Later in the week, Coronado's wildcat was coring ahead below 4765 feet, having picked up a third probable producing zone. On cores, it showed a gas sand at 4686-98 feet, oil and gas sand at 4698-4703 feet, and hard sand with distillate odor at 4703-8 feet. A drill stem test through ¼-inch chokes, top and bottom, showed 430 pounds working pressure, with no fluid, in 5 minutes.

Laredo area furnishes new pool and field extension

Laredo.—One pool was opened, a major field extension was effected, and two wildcats were showing for possible field discoveries last week in the Mirando district of South Texas. It was one of the most eventful weeks in months in this territory.

Mayfair Oil Corporation's I. Gutierrez 1, about 8 miles northeast of Randado in Jim Hogg County, November 17, was rigging up pumping equipment after it failed to flow from the Loma Novia sand at 3217-23 feet. The test filled 400 feet with oil, and swabbed about 35 barrels of 31.5-gravity crude per day from this level. Screen was pulled, and the hole bailed dry, following which it was swabbed. The fluid filled into the hole at the rate of slightly in excess of 1 barrel per hour, but the pressure would not build up.

The test, located on a Texas company farmout, is in Block 4, of the Mayfair Subdivision E1, Peyote Grant. It showed salt water in the Government Wells sand at 3111 feet.

Coring a showing of oil and gas in a sand apparently at the top of the Cockfield formation at 5399-5405 feet, Humble Oil & Refining Company's Mestina Oil & Gas Company 2, was being tested. It has had trouble with getting a seat for the tool, several tests failing. The well is in the southwestern portion of the Francisco Pena

South Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Bexar County—		
Noake, Griffin 1 (wc)	*	550
Rosenberg Oil Company, Kelso 2 (Alta Vista)	*	1040
Brooks County—		
Humble O & R, McGill 32 (Kelsey)	*	4752
Humble O & R, McGill 33 (Kelsey)	500	4726
Caldwell County—		
Arter-Ramos-Stewart, Brown 4 (Buchanan)	37	220
Duval County—		
Blanchard Oil Company, Low 1 (wc)	*	3502
Continental, Driscoll A-41	450	3356
Cox & Hamon, Cuellar 10 (Hoffman)	85	2672
Government Wells Oil Co., Lundell 37 (Lundell)	60	1555
North Sweden—		
Hiawatha Oil Co., Southland 17 (North Sweden)	425	4763
Humble, Duval 10-E, (Piedre Lumbre)	292	2110
Magnolia Oil Co., Duval 43 (Piedre Lumbre)	92	2174
Duval 44, (Piedre Lumbre)	300	2167
Weil 1, (wc)	¶6	2806
McElvain Oil Co., Mew 1 (Fitzsimmons)	55	4281
Rogers Oil Co., Rosen 1 (wc)	*	85
Sun, Brueggemann 20 (Fitzsimmons)	325	3281
Texas Co., Duval 33, SRC	*	1094
Gonzales County—		
Young Oil Co., Moor 1 (wc)	*	3353
Gaudalupe County—		
Magnolia, Dix 16 (Darst Creek)	550	2590
Jackson County—		
Boyle Oil Co., Mauritz 1-B, (Mauritz)	*	5676
Humble Oil Co., Kubecka 8, (Cordelle)	*	3001
Lewis Oil Co., Drushel B-7, (Cordelle)	*	2673
Magnolia Oil Co., West 28-A (West Ranch)	500	5216
Jim Hogg County—		
Henshaw Oil Co, Trevino 4-B	150	3021
Meek Oil Co., Trevino 1, (Colorado)	325	3056
Jim Wells County—		
Bridwell Oil Co., Smith 4 (Ben Bolt)	750	5266
Cox & Hamon Oil Co., Galveston 1 (Ben Bolt)	450	5449
Graham and Mosser, Mosser 7-A (Reynolds)	*	6025
Mosser 3-B (Reynolds)	375	4925
Bowell Oil Co., Johnson 1 (Ben Bolt)	525	5246
Howell Oil Co., Perez 1, (wc)	*	6531
Kleberg County—		
Pure Oil Co., State 1 (Bird Island)	*	8403
Live Oak County—		
Loma Oil Co., Vernor 1 (wc)	*	1253
Pohler Oil, Turner 1 (wc)	*	899
Simmons Oil Company, Reagan 7-B (Oakville)	*	2845
McMullen County—		
Rowe Oil Company, Reed 1 (wc)	*	1710
Thornton, Clifton-Wheeler 1 (wc)	*	1058
Walton, Chylex 1 (wc)	*	900
Nueces County—		
Seaboard Oil Company, LaPrelle 4-A	400	5085
Stanolind, Parr 2 (Minnie Bock)	150	3823
Spessard 30 (Luby)	375	5177
The Texas Company, Flinn 3 (Clara Driscoll)	475	4678
Refugio County—		
Quintana Petroleum Co., Williams 18-A (Tomoconnor)	1650	5925
San Patricio County—		
Houston Oil Co., Fee 5 (East White Point)	600	5680
Plymouth Oil Company, Kenneddy 1 (East White Point)	550	5643
Mayo Koonek B-1 (East White Point	600	5680
Southern Minerals, Dunn and Peterson 1 (McCampbell)	750	7150
Starr County—		
Colpton Oil Co., Green and Manning 1 (wc)	abd.	locn.
Stephens, Zamora 1 (wc)	*	504
Sun Oil Company, Speer 3, Sun field	350	5484
Warner Oil Company, Blanca 1(wc)	*	851
Webb County—		
A. and M. Yeager, Adam 1	*	1052
Schimmel, Valdez 1-a (West Cole)	*	2352
Zapata County—		
Dulup Oil Co., Trevino 5-C, (Escobas)	12	1242
Interstate Oil Co., Lopez 16, Mirando Valley	85	1781
Lopez 17, Mirando Valley	550	1781
Lopez 18, Mirando Valley	70	1781
Lopez 5-C, Mirando Valley	250	1783
Martinez and Condri, Bruni 1(wc)	*	938
The Texas Co., Measles 1229 (Escobas)	12	1211
Transwestern Oil Co., Montemaye		

*Failures; †Junked; ¶Million cu. ft. gas.

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"Palo Blanco" Grant, and is about 7 miles southeast of Hebbronville. It is the second well on a huge block taken by this company and worked with geophysics. High prices have been paid by independents as well as by the Humble concern for small tracts in this general area.

Duval County's strike of the week was the Magnolia Petroleum Company's A. Weil 1, located 990 feet out of the most northwesterly west corner of Section 113. First called a new field, it now is listed as a 2-mile southwest extension to the prolific Hoffman field. The well cored Government Wells sand at 2644-61 feet and Loma Novia zone at 2789-2806 feet. Production test was made in the lower pay without results. The well then was plugged back and perforations made at 2651-61 feet, and the test flowed 6,900,000 cubic feet of gas and showed 890 pounds rock pressure.

In Zapata County, Neilson and Wise were testing Maryland Trust Company 1, about 3½ miles east of the Escobas field and in Block 11, Section 314. The test cored Mirando oil sand at 1770-82 feet with good odor.

Texas Gulf Coast

League City outpost is state's deepest producer

Houston. — The deepest producing well in Texas went on record last week when Phillips Petroleum Company's Wimhurst 1, northwest outpost of League City, Galveston County, was brought in through the eyes of the bit from sand at 10,946-67 feet for an ungauged amount of gas and distillate production through a 6/64-inch choke. Casing pressure was 2900 pounds; tubing pressure, 2800 pounds. At one time the well recorded 5400 pounds pressure.

Previous record for producing zone depth was held by Old Ocean, Brazoria County, which yields oil from 10,600 feet. Anchor, same county, ranks third with a commercial pay at 10,466 feet.

Titanic Oil Company's efforts to open a new deep sand on the flank of Allen Dome, Brazoria County, looked disappointing when a drill stem test through perforations at 4022 to 4032 feet showed a little oil and gas. After drill stem test the drill collar twisted off. The hole is bottomed at 5230 feet.

Two thousand feet west of production at Martha field, Liberty County, Stanolind Oil & Gas Company's Tyrrell 1 was drilling in shale at 8302 feet, below the regular producing horizon.

Three wildcats were abandoned in Wharton County last week. J. F. Hutchin's Borden 1 in the Mackey area, H. Griffith Survey, was abandoned at 5434 feet after coring salt water sands up the hole. Humble Oil & Refining Company's Henry 1, N. B. Williams Survey, was dry at 6155 feet.

On the south side of Hastings field, Brazoria County, Standard Oil Company of Kansas was completing Butterfield 1 at 6113 feet through a ⅛-inch choke with a tubing pressure of 200 pounds and a casing pressure of 800 pounds.

Continental Oil Company announced location for a deep wildcat on a 5000-acre block northeast of League City. Lobit-Gharidi 1, 2000 feet east and 1150 feet south of the most northerly northwest corner of the Perry and Austin Survey, Abstract 19, is on a geophysical prospect. In the Cypress area, Harris County, Gulf Oil Corporation has made location for Mrs. H. H. Roberts 1, 1420 feet south and 50 feet east of the northwest corner of A. Roberts Survey. The test, projected to 7000 feet, also is on a geophysical prospect.

Merrimac Oil Company has announced location for a wildcat in the Gulf of Mexico off the shore of Jefferson County. State 72 is 50 feet east of H. M. Harrell's State 1, which was abandoned some time ago after having been reported to have cored several good oil shows in the Miocene formation.

On the Winnie Prospect, Jefferson County, Falcon-Seaboard Oil Company has made location for Powell 1, 330 feet north and 330 feet east of the northwest quarter of Lot 6, Cook Subdivision, B. A. Vaccou Survey. The wildcat is projected to 8000 feet or deeper.

Texas Gulf Coast Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Anahuac—		
Humble, Clark 23	603	7063
Cotton Lake—		
Humble, Lawrence D-1	7	6525
Fairbanks—		
Amerada-Stanolind, Foley 12	132	6848
Hastings—		
Stanolind, Curkeet B-35	602	6090
McDonald 7	445	6109
Joe's Lake—		
Republic, Hurd 26	384	7705
Hurd 27	499	7710
Magnet—		
McDannald Oil Co., Carsten-Broussard 1	77	5544
Mykawa—		
McDannald Oil Co., Clayton Brown 1	*	8012
Thompson—		
H. M. Naylor, Mussleman 5	874	7810
Withers—		
Texas Co., Broussard 17	108	5558
Broussard 18	112	5544
Pierce Estate B-42	92	5546
Galveston County—		
Sun, State 1-176, East Bay area, tract 176	*	8044
Wharton County—		
J. F. Hutchins, Borden 1, Mackey area, H. Griffith sur	*	5434
Sun, Poole 1, Lissie area, G. H. & H. R. R. No. 25	*	7349
Humble, Henry 1, Lane City area, N. B. Williams sur	*	6155

*Failures; †Junked; ¶Million cu. ft. gas.

Louisiana Gulf Coast

St. John the Baptist test looms as discovery well

Lake Charles.—Pan American Production Company's Mill 1, La Place prospect, will probably be the discovery well for the first producing field in St. John The Baptist Parish. Last week the operators made 3 drill stem tests. The last test made from 8363 to 8373 feet, recovered gas, distillate and a rainbow of oil in 5 minutes through ¼-inch chokes. Surface pressure was 725 pounds and the bottom-hole pressure was 3900 pounds. The company will probably plug back and make a drill stem test of sands at 8112 feet next week.

After Pan American Production Company has drilled to 10,175 feet in Mill 1 and set casing at 10,120 feet, above which three other sands have been tested.

Wildcat Looks Good

In Calcasieu Parish, Gulf Oil Corporation's Brannon 1 was drilling ahead in sandy shale below 9600 feet after coring salt water sands at different intervals from 9194 to 9377 feet. This wildcat logged sands at 8939 to 8953 feet which had a slight show of oil. An electrical log showed 4 ohms on normal curve, 1 ohm on third curve and 1½ ohms on fourth curve. Side wall cores taken at 8940 feet, 8946 feet, 8950 feet had a good odor and cut of oil. Drilling continues.

Shell Oil Company is running geophones in Iberville Land Company 1 at Happytown, Iberville Parish, at 10,000 feet. This important wildcat has attracted considerable attention since a sand with a show of oil was cored at 9736 to 9757 feet. Two attempted drill stem tests of the sand failed. However, on the last one operators recovered a little 38 gravity oil, which

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might be produced in commercial quantities if a production test is made.

Shell Oil Company's Natalbany Lumber Company 2, potential discovery well on the St. Gabriel prospect, St. Martin Parish, was drilling in sandy shale at 9500 feet at the end of the week. Cores taken at 9095 to 9108 feet consisted of lime with a show of oil, 9124 to 9127 feet, shale with streaks of sand with a show of oil, and at 9150 feet, shaley sand with a show of oil.

New Sand Found

A new oil sand was discovered at Quarantine Bay field, Plaquemines Parish, by Gulf Oil Corporation's State QQ-15. The well was tested in oil sands at 7693 to 7721 feet and came in flowing 54 barrels of 34.4 gravity pipe line oil in 2 hours through a ¼-inch choke, with a tubing pressure of 1900 pounds and a casing pressure of 700 pounds.

The Texas Company will attempt to open a new producing sand at Fausse Point, Iberia Parish, with State 6, drilled to 5414 feet in salt, topped at 5408 feet. Seven-inch casing was set at 5314 feet and the company probably will perforate casing at 5159 to 5165 feet, where the shallowest oil sand yet found at Fausse Point was cored.

Superior Oil Company's State 4 discovered a new gas sand at Grand Lake field, Cameron Parish, when a drill stem test at 8259 to 8274 feet recovered gas. The company has shut the well in and probably will make another test in the regular producing sand around 8400 feet.

On the northeast side of Lafitte, Jefferson Parish, The Texas Company is testing a new sand. State Bayou Norman 2 was perforated with 160 shots from 9320 to 9360 feet and started flowing through the drill stem at the rate of 900 barrels of 38.5 gravity oil daily. Pressure was 1245 pounds.

In the North Elton area, Allen Parish, Stanolind Oil & Gas Company's Jenkins 1, second well for the area, was drilling in sandy shale at 7424 feet and is reported to be from 40 to 50 feet lower than the discovery well on structure.

The second wildcat failure for the Grandison prospect, Lafourche Parish, was reported last week when Gulf Oil Corporation abandoned Grandison Lumber Company 2 at 12,200 feet in shale. No shows of oil were reported. Gulf's first wildcat on the prospect also was drilled to below 12,000 feet.

On the Broussard prospect, Lafayette Parish, Stanolind Oil & Gas Company's Billeaud 1 was drilling in shale at 10,350 feet after running an electrical log to 10,177 feet. Side wall cores at 9798 to 9810 feet failed to show anything of commercial importance.

The deepest well ever drilled at Venice dome, Plaquemines Parish, is Tide Water Associated Oil Company's Buras Levee 6, on the flank. It was coring below 10,700 feet after picking up a new producing sand at 9714 to 9734 feet, the deepest oil sand encountered at Venice.

South Louisiana Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Bancroft—		
Republic, Lewis Whitman 3	*	7662
Baton Rouge—		
Wm. Helis L. S. U. 5	135	6493
Sugar Field Oil Co., Nichols 1	44	4390
Begent Dr. Co., Bogan Davidson 1	140	6500
Charenton—		
DeArmand, Allemand 7	291	1163
Boudreaux 7	210	1150
Landry 1	168	1211
Landry 3	226	1208
St. Mary Oil Co., Hertel 3-B	*	3755
Chalkley—		
Humble, Sweet Lake Land Co. 5	*	8393
Eola—		
Amerada, Glaze 4	747	8545
Golden Meadows—		
Acadian Prod. Co., LeBlanc 1	144	2670
Berkshire Oil Co., Nicol 6	336	5230
Nicol 7	264	2670
St. Mary Oil Co., Wilbanks 1	300	5178
Iowa—		
Shell, Heyd 29	356	4460
Lake Mongoulois—		
Texas Co., State 7, dr to 10,775 ft pb and comp	100	9970
Quarantine Bay—		
Gulf, State QQ-15	648	7721
Ville Platte—		
Continental, Fontenot 5	359	9057
Coriel 2	279	10,360
Vidrine 1, Tract 11	272	9077
J. K. Hughes, Ortego 1, (wo)	226	10,157
West Lake Verrett—		
Shell, Michel 1	*	11,678
Jefferson Parish—		
California Co., Adams Rutley 1, Barataria area, 2-16s-23e	888	8214
Lafourche—		
Gulf, Grandison Lbr. Co. 2, Grandison prospect	*	12,200

*Failures; †Junked; ¶Million cu. ft. gas.

High ratio of Louisiana permits on Gulf coast

Thirty-nine drilling permits were issued last week by the Louisiana Conservation Commission, of which 11 were in North Louisiana divided among the following parishes: Bossier, two; Caddo, seven; and Sabine, two. The 28 in South Louisiana were in the following parishes: Acadia, one; Ascension, one; Avoyelles, one; Calcasieu, one; Cameron, one; Evangeline, three; East Baton Rouge, two; LaFourche, seven; Plaquemines, two; Rapides, one; St. Martin, one; St. Mary, three; Terrebonne, two; and Vermilion, two.

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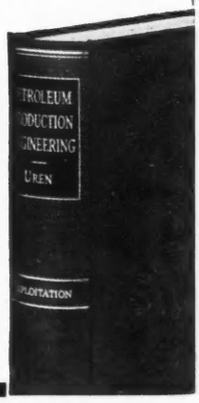

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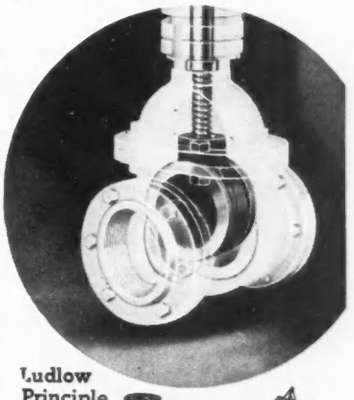

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North Louisiana

Waskom wet-gas field is extended into Louisiana

Shreveport.—Arkansas Fuel Oil Company's W. M. Bell 1, SW SW 6-17n-16w, Caddo Parish, was completed last week in the Travis Peak to extend the basal Glen Rose lime-Travis Peak wet gas producing field at Waskom 2¼ miles northeast into Louisiana, across the Texas line. Drilled to 6400 feet, the well was plugged back and casing perforated at 5915-35 feet, at 5975-95 feet, and at 6060-6100 feet, and completed gauging 10,500,000 cubic feet of wet gas daily.

Lisbon Exploration Company's lower Marine test in Lisbon, Claiborne Parish, Roberta Vaughan 1, NW NE 36-21n-5w, showed salt water when casing was perforated at 8354-83 feet in the lower Marine (Cotton Valley), and operators were squeezing off perforations preparatory to testing two other lower Marine zones, where showings were logegd, at 8458-68 feet and at 8816-40 feet.

Although the salt was logged considerably lower in the second test, Continental Oil Company's second hole on its Franklin Parish geophysical wildcat test, Federal Land Bank 1, NW NW 26-13n-8e, was abandoned last week in salt at total depth of 4041 feet, after topping the salt at 3935 feet; elevation is 86 feet. The first test on the salt dome logged the salt at 1795 feet and was abandoned in that formation at 1839 feet. Continental is curing titles on a block near Sicily Island, Catahoula Parish, also a geophysical prospect, preparatory to drilling a test on it.

Seven miles southeast of production in the Shreveport field, David J. Crawford and Associates' Lloyd 1, SW SW 29-17n-13w, Caddo Parish, a geophysical prospect, was abandoned as a dry hole at 6003 feet, without finding production in the Pettet, producing horizon in the Shreveport field. With elevation of 172 feet, this test topped Nacatoch at 900 feet, logged base of chalk at 1660 feet and topped anhydrite at 4387 feet. It had a gas blowout at 1407 feet while drilling, caught fire, and four members of the crew were injured, one fatally. The well was about 1½ miles southwest of a 6000-foot dry hole and about 3 miles north of a similar failure.

After having flowed steadily for two weeks, Temple Oil Company's Bostwick 1, NE SE SW 13-22n-16w, Caddo Parish, completed in the Tokio at 2559 feet, 1½ miles north of the old Hosston shallow field, ceased to flow last week and is being re-worked. Stanolind Oil and Gas Company's Dillon 131, C SE NE 14-21n-15w, deep test in the old shallow Pine Island field, drilled in Permian salt at 11,320 feet, having topped this formation at 10,164 feet. It neared the depth record for the North Louisiana-Arkansas territory of 11,486 feet.

Geologically, the deepest test ever drilled in the Shreveport territory, Union Producing Company's Tensas Delta A-1, NE SW SE 8-22n-4e, Morehouse Parish, drilled at 9307 feet, after logging Permian salt from 8114 to 9082 feet; elevation is 71 feet. It is on the northeast flank of the Monroe shallow gas field.

North Louisiana Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Caddo Parish (Pine Island)—		
Milam Production Co., C. A. Patrick 1, 1-20n-16w	50	1471
J. Ray Murray, Standard Oil Co. Fee 1, 12-21n-16w	20	2312
Texas Company, Louisiana Company Fee 5, 1-20n-16w	350	1480
W. E. Noel B-19, 14-21n-15w	50	1648
Caddo Parish (Waskom)—		
Arkansas Fuel Oil Co., W. M. Bell et al 1, 6-17n-16w	¶10½	6400
Franklin Parish (Wildcat)—		
Continental Oil Co., Federal Land Bank 1, 26-13n-8e	*	4041
La Salle Parish (Urania)—		
Montague Oil Co., Fee 1, 10-9n-1e	*	1526
Webster Parish (Cotton Valley)—		
Magnolia Pet. Co., D. G. Cox 3, 22-21n-10w	*	6265

*Failures; †Junked; ¶Million cu. ft. gas.

Arkansas

Four wells define Magnolia; Buckner edge well big

El Dorado, Ark.—With completion of 4 oil wells last week and a fifth in course of completion, which will bring the total to 77 producers, the Magnolia field, Columbia County, Arkansas, appears to have reached its peak, and drilling hereafter will probably be confined to interior offsets, as operators believe the limits of production have been neared in directions not definitely marked by dry holes. Only one new location, Standard of Louisiana's W. F. Merritt B-1, SW NE SE 16-17-20, was staked last week.

On the west edge of the Buckner field, across the Columbia County line in LaFayette County, Standard Oil Company of Louisiana completed H. B. Eddy 2, SE SE 12-16-23, at 7287 feet, flowing 2000 barrels of oil per day from 24 feet of saturation. It is the sixteenth oil well and one of the best for the field, which was opened in November, 1937, the first Smackover lime field in Arkansas. Standard made location for Crone 4, NW SW SE 8-16-22. All the

Arkansas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Columbia County (Magnolia)—		
Shell Oil Co., Inc., W. F. Merritt 2, 15-17-20	450	7646
Southwood Oil Co., Inc., A. L. Poindexter C-1, 23-17-20	375	7657
Standard Oil Co. of La., Gunnels B-1, 19-17-19	850	7600
Grady Vaughn-Deep Rock Oil Co., Joel Jones Unit 1, 21-17-20	350	7636
Clark County (Wildcat)—		
Coker Oil Corp. of Ark., H. Cabe 2, 8-10s-20w	*	415
La Fayette County (Buckner)—		
Standard Oil Co. of La., H. B. Eddy et al 2, 12-16-23	2000	7287
Ouachita County (McDonald)—		
Sherry-O Brien, Cook Estate 1, 27-15-18	¶15	1618
Union County (Smackover)—		
Crestrock Oil Co., Emma Riley 1, 9-16-15	10	2415

*Failures; †Junked; ¶Million cu. ft. gas.

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A new shallow producing level was found in the old shallow McDonald field, Ouachita County, which has been inactive for 9 years, in Sherry-O'Brien's Cooke Estate 1, Section 27-15-18, completed at 1605 feet after plugging back from 1618 feet, making 15,000,000 cubic feet of gas daily.

Gulf Refining Company is building road to its recently staked Smackover lime geophysical wildcat prospect in Columbia County, Nancy Lewis 1, SW NE 12-18-23, 3½ miles northeast of the Dorcheat (Experiment) area, latest of the Smackover lime oil fields in south Arkansas.

New Mexico

Shallow wildcat in Colfax County opens gas field

Hobbs, N. M.—Shallow gas strike for northeastern New Mexico is credited to York Denton et al's Tex-Mex 1, NWc 2-26n-24e, Colfax County wildcat that began operations 2 years ago. The well developed an estimated yield of 8,000,000 feet daily from sandy-lime at 1515-25 feet with an elevation of 6224 feet. It is about 11 miles east of Maxwell.

Prospecting around the Loco Hills area, Eddy County commanded attention when Leo Manning et al's McClay 1, NE NW NE 21-18s-30e, logged top of Yates sand at 1450 feet with an elevation of 3463 feet. It is about 120 feet higher structurally on this marker than Martin & Jones' Gates 1, situated ¾ mile east by north, and was drilling lime at 2110 feet. Gates 1 opened a new pool last August after a nitro shot in sandy-lime at 3204-45 feet.

Argo Oil Corporation's State-Texaco 1, ¼ mile west of the Halfway pool, Western Lea County, discovery pumper, checked 29 feet low in drilling saturated lime at 2654-57 feet, with an elevation of 3510 feet. Brief bailing test indicated that the fluid level was ample to make a small well. Acid will be used before attempting a pumping test. Westlea Oil Company's Cleveland-Texaco 1-C, south outpost for the area, was slated to reach the pay level late last week.

Two Lea County wells experienced gas blowouts, resulting in the killing and plugging of one as a safety measure, while the other has been out of control for a week. Texas Pacific Coal & Oil Company's State 8-A, Lynn area, blew out at 2975-82 feet damaging the uncased hole. Circulation was restored long enough to cement the hole. Rig was skidded 50 feet east. Stanolind Oil & Gas Company's Gilluly 6-B, C N½ NE NE 21-20s-37e, Monument field, continued to flow in excess of 30,000,000 feet of dry gas daily after drill pipe stuck at 3423 feet. A parted string of casing complicated the situation.

The south trend of production in the prolific lime pool situated between the Eunice and Penrose areas is open for additional extensions. Proof was offered by Ohio Oil Company's State-McDonals 11, NEc 12-22s-36e, which flowed 40 barrels hourly natural at 3735 feet.

New Mexico Completions

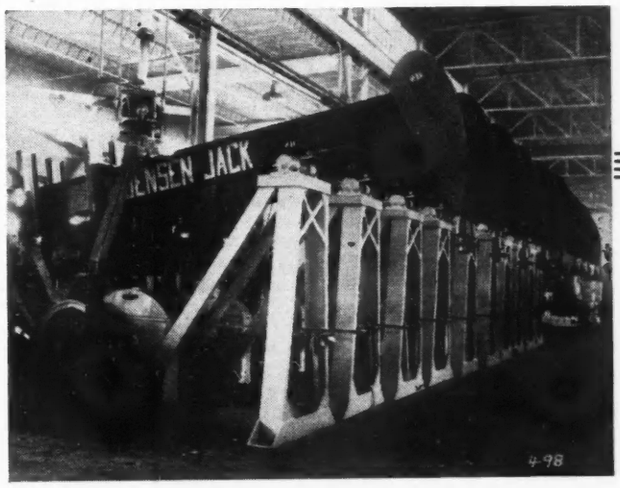
Company, Well and Location	Init. Prod. Bbls	Depth
Eddy County—		
Carper Drl. Co. et al, Robinson 4, sec sw 25-16s-31e	25	4025
Flynn-Welch & Yates, Gissler 10-A, se nw se 14-17s-30e	55	3429
Premier Pet. Co., Beeson 3-F, sec sw 31-17s-30e	†	725
Lea County (Haray)—		
Gulf Oil Corp., Mattern 3-B, c ne ne 31-21s-37e	152	3800
Lea County (Lovington)—		
Skelly Oil Co., State 3-O, c w½ sw se 31-16s-37e	960	5032
Lea County (Lynn)—		
T. P. Coal & Oil Co., State 8-A, Acct. 1, c sw se 21-23s-36e	†	2982
Lea County (Mattix)—		
Skelly Oil Co., Sherrill 1, c se se 31-24s-37e	137	3540
State 2-M, c nw sw 32-24s-37e	333	3541
Lea County (Vacuum)—		
Humble, State 10-K, c sw se 28-17s-35e	1032	4640
Republic Prod. Co., State 4-B, c se sw 32-17s-35e	672	4550

*Failures; †Junked; ¶Million cu. ft. gas.

Michigan

Buckeye field deepening program is in prospect

Mt. Pleasant, Mich.—A second pay zone in the Dundee lime horizon of the 3-year-old Buckeye oil field, Gladwin County, under test by the J. V. Wicklund Development Company, may prove the incentive for an extensive deepening program. Wicklund deepened State A2, SE SW SE Section 11-18n-1w, Gladwin County, from 3630 feet (original completion point) to 3665 feet and logged saturation from 3658-62 feet with an increase in gas. The well did not flow, but on a 3-day pump test averaged 64



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barrels per day, pumping 86 barrels the first 24 hours.

Ten Wells Deepened

The first deepening already has brought a 10-well deepening program for the field in the immediate area of State A2. However, enough data are available to fairly well indicate that this second pay probably will not materialize generally over the Buckeye field, which includes two pools, divided into the North and South fields. The North field (A2 is the east offset to the discovery of the field) had a maximum of 2620 producing acres and 264 wells. Recovery averaged 4567 barrels to the acre on September 1, and in September, production had dropped to 157,671 barrels for the month.

The South field had a maximum of 1820 producing acres and had produced 3,290,309 barrels (as against 12,476,000 in the North field) as of September 1 this year. The South field was down to 29,000 barrels a month in September, and operators were rapidly pulling in most sections of the field.

Michigan Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Allegan County—		
Mich. Devonian's Czerney 1, sw nw sw 21-4n-12w	*	1683
H. W. Siegworth's Hall 1, ne sw se 1-1n-12w	*	1835
Lentz & Millers' Berens 1, nw se se 27-4n-14w	110	1588
Fortney Oil Co.'s Boerman 1, ne ne sw 27-4n-14w	180	1470
C. W. Cook's Kopper 1, ne ne nw 34-4n-14w	60	1511
Voorhees Drlg. Co.'s Loew 3, nw se sw 3-4n-13w	*	1685
Salem Oil Co.'s Gaca 3, se nw sw 14-4n-13w	125	1599
Mich. Devonian's Green 3, ne sw se 4n-13w-15	300	1577
Gulf Ref. Co.'s Zefas 2, se se ne 15-4n-13w	60	1593
Arenac County—		
W. E. Ross' Crandall 3, c ne se 10-20n-4e	¶10	1188
Chief Oil Co.'s Koelsch 1, nw nw nw 16-18n-4e	*	2923
Clare County—		
American Prod. Co.'s Ann Arbor R.R. 2, c sw 21-18n-5w	¶11	1516
Gulf Ref. Co.'s State 1, s½ se ne 29-19n-6w	1060	3859
Pure Oil Co.'s State-Sparrow 3, s½ nw se 29-19n-6w	250	3864
Clinton County—		
Clinton Pet. Co.'s Loesch 1, se sw sw 18-5n-2w	*	2995
Gratiot County—		
Conatron et al's Knickeley 1, c s s nw 5-10n-4w	*	1215
Kalamazoo County—		
Bliss Keeler's Blanchard 1, sw nw sw 31-3s-11w	*	1289
Kent County—		
Gordon Oil Co.'s Molloy 1, sw nw sw 28-7n-12w	*	1925
Klont 1, c w½ nw ne 29-7n-12w	60	1901
Louis Rose's Linacre 3, se sw se 29-7n-12w	218	1896
Smith Pet. Co.'s Thurkettle 2, nw se sw 29-7n-12w	400	1910
H. C. William's Thurkettle 3, sw ne sw 29-7n-12w	1500	1877
Eastern Pet. Co.'s Thurkettle 1, ne se sw 29-7n-12w	400	1875
Basin & Gordons' Wildeboer 3, nw ne nw 31-7n-12w	900	1859
Certain-teed Corp.'s Fee A2, sw ne se 33-7n-12w	30	1921
Smith Pet. Co.'s Cudahy 2, se se nw 33-7n-12w	350	1850
Geo. Kernodle's Van Dam 1, sw sw nw 33-7n-12w	180	1890
Smith & Wagner's Gilbert 10, ne ne sw 4-6n-12w	30	1773
Lenoran Pet. Co.'s Maynard 5, se nw sw 4-6n-12w	275	1802
Welch Oil Co.'s P. M. R. R. A1, nw sw sw 3-6n-12w	360	1791
P. M. R. R. 5, nw ne sw 3-6n-12w	1200	1757
Lamar Oil Co.'s Gravel Co. 4, ne se sw 4-6n-12w	60	1793
H. C. William's G. R. Trust 1, se sw sw 4-6n-12w	80	1793
Swanson Oil Co.'s Richardson 1, sw nw se 13-6n-12w	*	1941
Fisher-McCalls' Klaver 1, c e nw ne 23-6n-12w	50	1916
Clapsaddle & Harris' Kammen 1, ne nw nw 24-6n-12w	*	1971
Mecosta County—		
Red-Man Oil Co.'s Grove 1, nw ne sw 14-15n-7w	¶3½	1375
Newaygo County—		
Chas. Hoffman's Comstock 1, ne se ne 27-11n-14w	*	2144
Ottawa County —		
V. Leonard's Strick 1, sw nw se 29-5n-13w	*	1712
E. B. Strom's Brenner 2, c w ne se 25-7n-13w	600	1871
Park 3, sw se ne 25-7n-13w	900	1900
Twin Drilling Co.'s Park 3, sw ne ne 25-7n-13w	940	1913
Freeman Oil Co.'s Poppen 1, sw sw sw 4-5n-14w	*	1998
Tuscola County—		
Smith Pet. Co.'s McLaren 1, c e nw se 22-14n-7e	*	3512
Van Buren County—		
R. H. Grant's Dean 1, ne sw sw 12-1s-15w	*	1213

*Failures; †Junked; ¶Million cu. ft. gas.

Rocky Mountain States

Lance Creek field is extended to southwest

Casper, Wyo.—A good completion on the southwestern edge of the Lance Creek field, stimulated activity in the eastern Wyoming producing district last week. The new producer, C. L. Price's Lamb 2, CSE NW NW 7-35n-65w, an outside location, tested 71 barrels of oil per hour through tubing from total depth at 5487 feet in the Leo sand, second Minnelusa producing horizon. The well will call for several offsets on adjoining acreage, having extended the producing area ¼ mile to the south and west.

The California Company's record deep wildcat in Wyoming, Unit 1, CSW NE 14-31n-109w, showed for 20,000,000 cubic feet of gas daily under 3000 to 4000 pounds per square inch rock pressure from the Fort Union formations, in which hole bottoms at a total depth of 10,003 feet. The well began cutting the drill string and after a 30-minute test it was shut in to install heavier equipment. This is the first well in the area to develop commercial oil or gas shows in the Fort Union formations. Located well toward the center of the Green River geo-basin, the well may open a new exploratory campaign for these formations in other sections of the state. The Fort Union beds are members of the lower Tertiary period.

Montana Completions

Company, Well and Location	Init. Prod Bbls.	Depth
Glacier County (Cut Bank)—		
Glacier Production Co., Stott 1, cse nw 34-33n-5w	22	3105
Texas Co., Bonnett 2, csw se 8-32n-5w	133	2961
Teton County (West Pondera)—		
Tarrant-Kirk, Hoeschen 1, cne se 34-27n-5w	¶1-1/3	1900
Toole County (Kevin-Sunburst)—		
G & A Oil Co., Goeddertz 14, nw se sw 23-35n-3w	25	1678
A. Beardslee's Swears 8, csw nw 9-35n-2w	20	1713

Wyoming Completions

Company, Well and Location	Init. Prod Bbls.	Depth
Niobrara County (Lance Creek)—		
Continental Oil Co., Dielman 4-B, sw sw nw 8-35n-65w	1728	5548
Ohio Oil Co., Lamb 13, cnw se ne 5-35n-65w	2280	5487
Leo 1, OPC-16, cne ne sw 35-36n-65w	232	4356
Sweetwater County (Middle Baxter Basin)—		
Mountain Fuel Supply Co., G. Howard Morey 1, nw nw nw 18-18n-104w	¶1/3	2610

*Failures; †Junked; ¶Million cu. ft. gas.

California

Oil well promises linking of Rio Bravo and Greeley

Los Angeles.—Possibility of a linking together of the Rio Bravo and Greeley fields, Kern County, was strengthened last week when General Petroleum Corporation completed Sullivan 1, mid-way between the two areas, as a flowing well, yielding 1850 barrels of 39-gravity oil daily from 11,510 feet.

Further proving up of the acreage between Rio Bravo and Greeley is anticipated, through wells now drilling and others likely to be started.

In the Rio Bravo field proper, Union Oil Company's KCL 41-34, 34-28-25, is slated for immediate completion with bottom at 11,475 feet. Superior Oil Company's Weber 1, northwesterly outpost in 27-28-25 has been completed for 3500 barrels daily from 11,465 feet.

Shell Oil Company's San Emidio wildcat at the extreme south end of the San Joaquin Valley and eight miles west of Wheeler Ridge has reached a depth of 12,000 feet. It is the deepest hole drilled on the south edge of the valley and one of a dozen that have searched for oil in the district. Opinion prevails that if oil is found at San Emidio it will be at an extreme depth. Western Gulf Oil Company's discovery of the Paloma field eight miles north of San Emidio has brought other operators into the area to wildcat.

California Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Los Angeles County (East Coyote)—		
Union, Hole 21	1120	4673
Los Angeles (Dominguez)—		
Shell, Reyes 9	560	4230
Orange County (Huntington Beach)—		
Petromont Oil, Burton 2	30	4470
Los Angeles County (West Montebello)—		
Hathaway Company, Dore 2	468	7645
Texas Co., Wilcox 1	1150	7687
United Montebello Oil, No. 2	250	7650
Los Angeles County (Richfield)—		
Traders Oil, No. 1	112	4771
Los Angeles County (Rosecrans-Athens)—		
Union, Rosecrans 35	175	7627
Los Angeles County (Wilmington)—		
Dumm Bros. Pet. Co., Dumm (LB) 3	267	3505
Long Beach Oil Dev., "W" (LB) 3	150	4057
"W" 7	450	4034
"X" 12	345	3958
Royalty Service, Community 2	175	3680
Union Pacific, UP (LB) E-20	1264	4047
Kern County (Canal)—		
Ohio, KCL E-15	1502	8326
Fresno County (East Coalinga Eocene Pool)—		
Robt. S. Lytle, No. 64-7F	2100	8108
Texas Co., Exeter 3	2538	8220
Kern County (Kern River)—		
D & D Oil, No. 6	5	630
Helm & Smith, H & S 15	5	672
Kern County (Mt. Poso)—		
Ring Oil, Bowles 10	350	1802
Kern County (Rio Bravo)—		
Superior, Weber 1	3500	11,465
Ventura County (Shiells Canyon)—		
Savage Oil, Calumet 2	130	2984
Ventura County (Ventura Avenue)—		
Calif. Alliance Pet., Hartman Ranch 1	450	7555
General Petroleum, Barnard 16	460	8452
Kern County (Devils Den)—		
Texas Co., Beer 1	*	3491

*Failures; †Junked; ¶Million cu. ft. gas.

WILDCAT REPORT
New Starts and Completions

STATE	WILDCATS STARTED		WILDCAT TESTS COMPLETED							
			Total		Oil		Gas		Dry	
	This Week	This Year	This Week	This Year	This Week	This Year	This Week	This Year	This Week	This Year
Alabama	...	5	...	3	...	...	...	...	...	3
Arkansas	...	35	1	24	...	2	...	...	1	22
California	...	185	...	76	...	20	...	2	...	54
Colorado	...	4	...	2	...	...	...	...	...	2
Florida	...	3	...	1	...	...	...	...	...	1
Georgia	...	4	...	1	...	...	...	...	...	1
Illinois	16	547	6	413	...	27	...	2	6	384
Indiana	2	69	2	44	...	9	...	1	2	34
Kansas	8	229	7	215	3	56	1	10	3	149
Kentucky	2	62	4	34	...	8	...	...	4	26
Louisiana	2	121	3	96	1	14	...	3	2	79
North Louisiana	...	40	2	29	...	3	...	1	2	25
South Louisiana	2	81	1	67	1	11	...	2	...	54
Maryland	...	1	...	...	...	...	...	...	...	...
Michigan	7	245	7	304	...	21	...	...	7	283
Mississippi	1	25	...	10	...	1	...	...	...	9
Missouri	1	58	...	33	...	...	...	3	...	30
Montana	...	5	...	3	...	...	...	...	...	3
Nebraska	...	1	...	1	...	...	...	...	...	1
New Mexico	1	39	...	27	...	1	...	1	...	25
New York	...	1	...	5	...	1	...	2	...	2
Oklahoma	5	161	5	161	2	29	...	8	3	133
Ohio	...	4	1	11	...	1	...	...	1	10
Pennsylvania	...	3	...	6	...	...	...	1	...	5
South Dakota	...	2	...	2	...	...	...	...	...	2
Texas	24	1,002	24	1,055	...	95	1	22	23	938
East Texas	1	109	...	101	...	3	...	1	...	97
North Texas	1	128	4	204	...	27	...	1	4	176
Gulf Coast	6	112	5	90	...	8	...	1	5	81
Panhandle	...	11	...	10	...	...	...	1	...	9
South Texas	15	473	15	481	...	38	1	16	14	427
West Texas	1	169	...	169	...	19	...	2	...	148
Utah	...	1	...	...	...	...	...	...	...	...
West Virginia	...	2	...	1	...	...	...	...	...	1
Wyoming	...	7	...	4	...	...	...	...	...	4
Total U. S.	69	2,821	60	2,532	6	276	2	55	52	2,201

ARKANSAS

COMPLETIONS

Clark County—Coker Oil Corp. of Ark., H. Cabe 1, c ne nw ne 8-10s-20w, claimed show oil 352-408 ft, dry aband td 415 ft.

ILLINOIS

FIRST REPORTS

Bond County—Bond Oil Co.'s Albert Wade 1, 70 ft from the s line and 1758 ft from the w line, sw 16-6n-4w, dk.

Clay County—Dick Bennett's R. E. Smith 1, 150 ft from the n line and 150 ft from the e line, sw 21-5n-5e, spud.

Edwards County—Harry Thorp et al's Broster 1, c nw se nw 33-1s-14w, moving in rotary tools.

Effingham County—Kingwood Oil Co.'s Reichhelm 1, 340 ft from the n line and 610 ft from the e line, ne 21-6n-6e, dk.

Fayette County—W. S. Tatum's C. T. Wade 1, nw sw ne 28-5n-4e, rigging up machine. Max Pray's Seibert 1, 60 ft from the w line and 30 ft from the n line, nw 10-7n-3e, dk.

Marion County—Boyd et al's Stouer 1, se ne nw 30-1n-2e, to deepen from 1835 ft.

Montgomery County—Henderson Bros.' Joe Ostermeier 1, c nw nw nw 30-10n-4w, spud.

Shelby County—E. L. Boeseke's M. C. Bigler 1, 330 ft from the n line and 990 ft from the e line, nw 12-9n-6e, mim.

Wabash County—Paxton Gray's Zimmerman 1, sw sw se 36-1n-13w, dk. Chet Evart's Trapp 1, 230 ft from the e line and 330 ft from the s line, ne ne 6-1s-12w, drilling below surface casing. Sowell & Ford's L. E. Meyer 1, ne ne nw 4-1s-13w, lcn.

Washington County—Shell Oil Co.'s Dix 1, c nw ne ne 19-3s-1w, dr 325 ft.

White County—Burr Lambert's Botsch 1, ne nw nw 6-5s-10e, mim. Vance Ford's Given 1, ne ne ne 10-5s-10e, lcn. W. R. Curry's W. A. Felix 1, nw nw sw 20-3s-8e, dr 400 ft.

COMPLETIONS

Franklin County—Gulf Refining Co.'s U. S. Fuel Co. 2, nw ne ne 32-5s-3e, top Devonian 4628 ft, abnd 4780 ft. E. S. Atkins' Old Ben Coal Co. 1, sw se nw 21-6s-2e, Browning tnp, top St. Louis 2895 ft, abnd 3000 ft.

Marion County—Tri-B Drilling Co.'s Dukes 1, ne ne nw 17-3n-1e, top Tar Springs 1113 ft, top Glen Dean at 1175 ft, top Hardinsburg at 1212 ft, top Golconda at 1240 ft, top Cypress at 1344 ft, top Weiler at 1376 ft, top Paint Creek Stray at 1445 ft, top Bethel at 1487 ft, abnd at 1509 ft.

Perry County—E. S. Atkins' Traux Traer Coal Co. 1, sw ne sw 25-5s-2w, Duquoin tnp, top St. Louis 1598 ft, abnd 1613 ft.

Wayne County—Illinois Mid-Continent Oil Co.'s Cope 1, c se ne se 28-1s-7e, Lamard twp, top Ste. Genevieve 3248 ft, abnd 3367 ft.

White County—Kingwood Oil Co.'s Metcalf 1, nw se se 31-3s-11e, Gray tnp, top Ste. Genevieve at 3067 ft, abnd 3098 ft.

INDIANA

FIRST REPORTS

Pike County—W. O. Allen, Jr.'s Electric Shovel Coal Co. 1, 200 ft from the s line and 1155 ft from the e line, se 28-2s-7w, rigging up rotary.

Spencer County—Schnell Trustee's Biggerstaff 1, sw sw se 6-7s-7w, rigging up machine.

COMPLETIONS

Knox County—J. S. Young, Jr. and W. H. Bode's Mabes 1, nw nw nw 27-5n-8w, top Mississippi lime 1209 ft, abnd 1275 ft.

Posey County—Al Wilhelmi et al's Zimmerman 1, 300 ft from the n line and 150 ft from e line, se sw 17-7s-14w, top Ste. Genevieve at 2793 ft, abnd 3021 ft.

KANSAS

FIRST REPORTS

Barber County—Patton Drilling Co.'s Hoss 1, c w½ nw sw 12-30-15w, lcn.

Butler County—Gralapp's Ireton 1, c e½ se ne 7-31-4e, pits.

Cowley County—Markey et al's Anderson 1, cnl e½ nw 21-30-3e, pits. Mitchell Drilling Co. et al's Botchelder 1, swc 27-30-6e, dr. Mission Oil Co.'s Hunt 1-A, swc ne 16-34-5e, mi materials.

McPherson County—Sunray's Anderson 1, cwl sw nw 17-20-5w, cellar. Fain Drilling Co.'s Briggs 1, cwl sw sw 21-20-5w, cellar.

Russell County—Shell's Bender 1, swc se 20-15-14w, dr.

COMPLETIONS

Barton County—Seaney et al's Schauf 1, csl e½ sw 1-16-12w, east of Prusa pool, top Arbuckle lime 3358 ft, 12 shots 3371-75 ft, 72 shots 2880-2905 ft sw and sso. td 3393 ft, abnd. Crown Petroleum Co.'s Schartz 1, sec nw 12-20-12w, ¾ mi w Ellinwood West pool, top Arbuckle 3343 ft, td 3363 ft, acidized 8000 gals, 126 bbls, 37.5 gr, completed.

Butler County — Marylyn Oil Co. et al's Hoard Ranch 1, sw ne ne 28-29-8e, 2½ mi nw Hannah pool, top Lansing 1625 ft, top Kansas City 2000 ft, so 2355-60 ft, top Mississippi 2836 ft, 200 ft oil 18 hrs, td 2889 ft, acidized 1000 gals, rig burned, abnd.

Johnson County—O K Supply Co. et al's Gardner 1, sec ne 4-14-22e, top Squirrel 615 ft, top Bartlesville 785 ft, pb 621 ft, set 2-inch tbg 621 ft, 180,000 cubic feet of gas, 4 mi n Gardner pool, completed.

Lyon County—Riddell et al's Boals 1, c nw 15-21-12e, 3 mi n Frankhouser pool, abnd lcn.

Rice County—Jones et al's Behnke 1, c w½ sw nw 25-18-10w, 1 mi e Orth pool, top Topeka 2450 ft, top Lansing 2863 ft, 2,106,000 cubic feet gas at 2950 ft, increased to 3,168,000 cubic feet, killed gas, set 8-inch 3045 ft, top conglomerate 3181 ft, top Quartzite 3204 ft, td 3209 ft, 805 bbls, 43.8 gr, completed. Phoenix Drilling Co.'s Linville 1, swc se 4-20-10w, e Silica pool, top Arbuckle lime 3388 ft, hfw 3396 ft, acidized 1000 gals, re-acidized 2000 gals, 15 bbls, completed.

KENTUCKY

FIRST REPORTS

Daviess County—Basin Drilling Co. et al's Howard 1, 2090 ft from the n line and 1050 ft from the e line, Section 11-N-28, 12-in to 57 ft, 10-in to 839 ft, dr below 1100 ft.

Ohio County—Owsley et al's Davidson Heirs 1, 1500 ft from the s line and 500 ft from the w line, Section 23-N-35, shut down at 300 ft.

COMPLETIONS

Breckenridge County—R. H. Grant et al's Jolly 1, 1650 ft from the n line and 4000 ft from the e line, Section 10-N-35, abnd 539 ft.

Butler County—Henry & Ross' Forsythe & Neal 1, 140 ft from the s line and 4650 ft from the e line, Section 12-I-34, abnd 1114 ft.

Daviess County—H. C. Farmer et al's P. Moorman 1, 1001 ft from the e line and 1540 ft from the s line, Section 23-N-29, abnd 1440 ft. Ohio Oil Co.'s Seay Heirs 1, 1050 ft from the w line and 1350 ft from the s line, Section 7-N-29, drilled through McClosky lime and abnd at 1889 ft.

NORTH LOUISIANA

COMPLETIONS

Caddo Parish—David J. Crawford et al, Lloyd 1, SWc 29-17n-13w, elev 172 ft, top Nacatoch 900 ft, gas blowout 1407 ft killed, base chalk 1660 ft, top anhydrite 4387 ft, dry abnd td 6003 ft.

Franklin Parish—Continental Oil Co.'s Federal Land Bank 1, NW NW 26-13n-8e, elev 86 ft, top salt 3935 ft, dry abnd in salt, td 4041 ft.

SOUTH LOUISIANA

FIRST REPORTS

St. Tammany Parish—LeRoy A. Guidry Canulitte Shipbuilding Co. 1, 3960 ft w, 5280 ft s of nec sec 9, in sec 44-9s-14e, dr gumbo 790 ft.

Terrebonne Parish—Barnsdall's Nelson Development Co. 1, Pt. Aux Fer Island, 565 ft s and 660 ft w of nec sec 2-21s-11e, lcn.

COMPLETIONS

Jefferson Parish—California Co.'s Adams Rutley 1, Barataria area, sec 2-16s-23e dr to 12,222 ft, pb and perf 8204-14 ft, 20 holes, comp. 74 bbls in 2 hours, ¼-in choke, gravity 37.3 tp, 1265 pounds; cp 1300 pounds.

MICHIGAN

COMPLETIONS

Allegan County—Michigan Devonian Petroleum Co.'s Czerney 1, sw nw sw section 21-4n-12w, abnd in Traverse dry, td 1683 ft. H. W. Siegworth's Hall 1, ne sw se sec 1-1n-12w, Traverse 1589 ft, td 1835 ft, dry.

Arenac County — Chief Oil & Gas Co.'s Koelsch 1, nw nw nw section 16-18n-4e, abnd 2923 ft.

Clinton County — Clinton Petroleum Co.'s Loesch 1, se sw sw section 18-5n-2w, abnd 2925 ft, dry in Dundee and Monroe lime.

Kalamazoo County—Bliss Keeler's Blanchard 1, sw nw sw section 31-3s-11w, Traverse 1250 ft, td 1289 ft, dry.

Newaygo County—Charles Huffman's Comstock 1, ne se ne section 27-11n-14w, abnd 2144 ft.

Ottawa County—V. Leonard's Strick 1, sw nw se section 29-5n-13w, Traverse 1652 ft, td 1712 ft, dry.

FIRST REPORTS

Barry County — Strange Oil & Gas Co.'s Olmstead 1, ne ne ne section 2-1n-7w, rig.

Kent County—Gordon Oil Co. et al's Miller 1, nw nw nw section 31-6n-11w, dr. J. W. McIntosh's Huber 1, se se sw section 30-9n-12w, dr.

Muskegon County—H. C. Nelson's Kittridge 1, c e½ ne section 2-12n-18w, lcn.

Osceola County—Michigan Devonian Petroleum Co.'s Reedy 1, c n½ se nw section 4-18n-7w, dr.

Shiawassee County — Van Lew Petroleum Syndicate's Willett 1, se ne sw section 8-5n-3e, lcn.

St. Clair County—William F. Malow's Ernest 2, nw sw nw section 27-8n-16e, lcn.

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MISSISSIPPI

FIRST REPORTS

Yazoo County—Conroe-Wilcox, Stubblefield 1, Section 25-12n-1w (4 mi n of Benton), dk and moving in rig.

MISSOURI

FIRST REPORTS

Livingston County — Chillicothe Syndicate Co.'s Linton 1, csl ne se 15-56n-23w, lcn.

NEW MEXICO

FIRST REPORT

San Miguel County—H. A. Hershfield et al's Jones 1, nwc 15-12n-22e, lcn.

OHIO

COMPLETIONS

Geauga County—Benedum-Trees Oil Co.'s S. L. Mather 1, Chardon tnp, top Newburg at 3242 ft, top Clinton at 3612 ft, abnd 4313 ft.

OKLAHOMA

FIRST REPORTS

Cleveland County—Smith et al's Corbett 1, c sw ne 20-6n-1e, otd 6760 ft, opb 6415 ft, co 600 ft, to test Dolomite.

Kay County—Zephyr Drilling Co. et al's High 1, ne nw nw 24-26n-2w, dr.

McClain County—Patsy Oil Co.'s 1, nw ne ne 15-5n-3e, lcn.

McIntosh County—Phillips' Blankenship 1, c sw nw 33-10n-13e, lcn.

Seminole County—Hall et al's Harber 1, nec nw 6-9n-7e, sd 3736 ft.

COMPLETIONS

Cotton County—McCarty et al's Jones 1, sec 24-4s-10w, 6 mi se Temple, td 1618 ft, abnd.

Greer County—Butler et al's Meyers 1-A, ne se nw 25-7n-21w, 1 mi e Granite pool, gas 660-65 ft, td 1228 ft, abnd.

Lincoln County—Kemp, Murray and Griffey et al's Burke 1-A, ne sw ne 20-17n-6e, completed, 3 mi ne Agra pool, top Prue 2864 ft, shot with 140 qts 2865-2900 ft, set tubing 2860 ft, 25 bbls.

McIntosh County—Scruggs et al's Tommy 1, se sw sw 19-21n-15e, 3 mi e Hoffman gas pool, top Cromwell 2870 ft, top Mayes 3265 ft, top Woodford 3469 ft, top Hunton 3505 ft, top Sylvan 3522 ft, so 2910-18 ft, so 2580-89 ft, td 3540 ft, hfw, abnd.

Oklahoma County — Hall and Briscoe's Thompson 1, swc ne 28-13n-1e, 4 mi e Jones, completed, top Cleveland 4797 ft, td 6058 ft, pb 4850 ft, perf 71 shots 4796-4808 ft, shot 10 qts 4786-4808 ft, co 4850 ft, 110 bbls, 35 gr.

TEXAS GULF COAST

FIRST REPORTS

Galveston County—Continental's Lobit-Gharidi 1, ne of League City, 2000 ft e and 1150 ft s of most NWc of Perry & Austin sur, lcn.

Harris County—Gulf's Roberts 1, Cypress area, 1420 ft s and 50 ft e of NWc of A. Roberts sur, lcn. Norcoff's Greens Bayou 1, three mi s of Clinton field, 330 ft out of SWc of lot 5, S. C. Hiaroms sur, lcn.

Jefferson County—Falcon-Seaboard's Powell 1, Winnie area, 330 ft f and 330 ft e of NWc of lot 6, B. A. Vaccou sur, lcn. Merrimac Oil Co.'s State 72, 50 ft e of H. M. Harrel's State 1, in Gulf of Mexico, lcn.

Liberty County—Hebert & Smith's Boyt 1, Double Gum Bayou area, 466 ft s and e of NWc of H. & T. C. sur, lcn.

COMPLETIONS

Galveston County—Sun's State 1-176, East Bay area, 660 ft fr e and 1980 ft fr s line of sec 176, East Bay, abnd 8044 ft.

Wharton County—J. F. Hutchin's Borden 1, Mackey area, 944 ft nw and 841 ft ne of Sc of 160-ac tract, H. Griffith sur, abnd 5434 ft. Sun's Poole 1, Lissie area, 330 ft out of Ec of N/4 G. H. & H. R. R. No. 25, abnd 7349 ft. Humble's Henry 1, Lane City area, 3494 ft se along sw line from Wc and 466 ft ne at right angles and 466 ft each way out of Sc of lot 16, N. B. Williams sur, abnd 6155 ft.

EAST TEXAS BORDER COUNTIES

FIRST REPORTS

San Augustine County—C. W. Burnaman et al's Fee 1, Harvey Hamby Sur, materials. (2500 ft test).

NORTH TEXAS

FIRST REPORT

Montague County—L. S. Youngblood-Foree-Feagin & Grimes' Mrs. W. L. Admire 1, 330 ft out of sec 80-acre lease, G. W. Fisher sur A-1223, lcn for 4500-ft test.

COMPLETIONS

Archer County—Shappell Oil Co.'s C. E. Carter 3, 450 ft from n and 1250 ft from w lines sec 37, blk 5, Clark-Plumb sur, abnd 935 ft.

Cooke County—Bridwell Oil Co.'s Joe Fisher 1, 750 ft from s and 1050 ft from w lines lot 10, John Barnett sur A-42, sands with trace oil 1682-89 ft and 1689-95 ft, abnd in hard lime 2131 ft.

Jack County—Ben Wells et al's Lester Carter 1, 450 ft from n and 150 ft from e lines sec 3315, TE&L Co sur, abnd 410 ft.

Montague County—O. C. Fisher-Holmes & Thomas' Reed-Texaco 1, 330 ft out of swc of east 105 acres of J. L. Graham sur A-295, abnd in solid granite 3822-24 ft.

WEST TEXAS

FIRST REPORTS

Pecos County—H. L. Cain et al's Lehman-Cities Service 1, 2310 ft from s and 990 ft from w lines H&GN sec 107, blk 8, lcn. A. C. Walker et al's Alva Reed 1, 2310 ft from nw and 330 ft from sw lines sec 20, blk 10, H&GN sur, lcn.

SOUTHWEST TEXAS

FIRST REPORTS

Caldwell County—Ralph R. Ogden's Fred Tally Estate 2, 740 ft se alg ne line fr intersection of Creek with ne line of sur, thence 465 ft sw at rt/a to lcn in 300-ac lse, W. C. Swearingen sur, 1 mi ne North Dale field, location.

Calhoun County—Continental Oil Company's Austin Estate 2, 2000 ft n, 1700 ft w of se cor, sec 2, blk J, Juan Cano Lge, 15 mi e Seadrift near Port O'Connor, drlg 5820 ft.

Duval County — Mills Bennett Production Company's Henry Adami 1, 990 ft n line, 914 ft e line of lse, in sur 349, 4 mi se Adami field, moving in rig. Frank J. Gravis' Frank Vaello, Jr., 1, 330 ft n line, 330 ft w line of 80-ac tr, in R. Fletcher sur 7, 2½ mi ne North Sweden field, dr 1011 ft.

Frio County — Sam Vanderweide et al's Witting 1, 466 ft n line, 466 ft w line of e½ of D. T. Price sur 6, 3 mi ne Shattel, location.

Guadalupe County—Wellington Oil Company of Delaware's Rio Bravo 1, 2640 ft sw line, 750 ft nw line of sec 5, H&TC sur, moving in rig.

Kleberg County—Humble Oil & Refining Company's H. Andrews 1, 330 ft e line, 660 ft s line of lot 13, blk 12, Kingsville Town and Improvement Company survey, location.

Nueces County—Shield Oil Company's N. S. Fulton 1, center of s½ of lot 8, Nueces River Park Irrigation subd, Mariano Lopez de Herrera gr, 3 mi ne Robstown, preparing to move in.

Refugio County — Norsworthy Production Company's Mrs. Mattie Wood 1, 3418 ft se line, 2486 ft ne line of 1003-ac tr, John Sinnott sur, ab-68, reinstated.

Refugio County—Seward and Falk's Muenzenberger 1, 990 ft n line, 330 ft w line, of s 300 ac tr, sec 17, Jose Maria and Jose Miguel Aldrete gr, moving in rig.

Webb County—W. C. McBride, Incorporated's M. Vela 2, 330 ft n line, 330 ft e line, blk 8, sur 263, 6½ mi n Oilton, location.

COMPLETIONS

Bexar County—Joe A. Noake's G. M. Griffin 1, 150 ft w line of 113.89-ac tr, 230 ft s of Missouri-Pacific RR and in R. Kirby sur No. 195½, top Navarro 485 ft, abnd 550 ft.

Duval County—J. B. Blanchard et al's J. G. Lowe 1, 466 ft n line, 466 ft e line of s½ of sur 72, 4 mi e Labbe field, abnd 3502 ft, tested sw on drill stem test at 3210 ft. Magnolia Petroleum Company's A. Weil 1 (113), 990 ft most n'ly nw line, 990 ft most n'ly sw line, CM RR sur 113, 2 mi sw Hoffman field, completed, td 2806 ft, estimated 20 mil cu ft gas, open flow, shut in pressure 800 pounds, perforated 2654-61 ft, retainer was set at 2663 ft, well swabbed dry from 2789-2806 ft, opens new producing area.

Gonzales County — E. E. Young's R. G. Moore 1, from s cor of 276-ac tr, nw alg sw line 2140 ft, thence 165 ft ne at rt/ang to lcn in D. O. Warren sur, 2 mi nw Nixon, abnd 3353 ft.

Jim Wells County—H. H. Howell's Mrs. S. G. de Perez 1, 330 ft nl, 330 ft w line, sec 339, SK&K sur, ab-463, 1¼ mi nw of Premont field, abnd 6531 ft.

Kleberg County—Pure Oil Company's State of Texas 1 (171), 440 ft sw line, 440 ft nw line of State Tract 171, in Laguna Madre, abnd 8403 ft.

Live Oak County—Loma Oil Company's Vernor Farm 1, 1760 ft se line, 180 ft sw line of 1182.6-ac tr, in John Turner sur, 8 mi w of Three Rivers, abnd 1253 ft. A. R. Pohler's A. J. Turner 1, from sw cor 780-ac tr, 3300 ft ne alg se line, thence 2780 ft nw at rt/ang to lcn, Stephen Hays sur, abnd 899 ft, tested oil and salt water.

McMullen County—W. Earl Rowe's M. H. Reed 1, 330 ft s line, 330 ft e line of A&M sur 153, abnd 1710 ft. R. M. Thornton, Jr., tr., Clifton-Wheeler 1, 1000 ft s line of 350-ac tr, and 2100 ft e of Bend in Frio River which is w line of tract, R. Ramon sur 11, 13 mi w Tilden, abnd 1058 ft. J. A. Walton's E. M. Chylek 1, 1980 ft s line, 5130 ft w line of 800-ac tr in sur 962, abnd 900 ft.

Starr County—T. E. Stephens' Ernesto Zamora Heirs 1, 150 ft n line, 150 ft e line of blk 17, Stevens subd of Sh. 67, Porc 72, abnd 504 ft, bailed sw.

Victoria County—George E. Smith et al's C. Stubbs 1, 2 mi sw Victoria field, location abnd, 250 ft nw line of 240-ac tr, and 300 ft ne line of Rafael Manchala sur, ab-487.

Zapata County—Martinez and Condren's A. M. Bruni Estate 1, 330 ft sw line, 330 ft se line of blk 23, Jose V. Borrege "Blas Uribe" gr, abnd 938 ft. Transwestern Oil Company's G. T. Montmayor 1-L, 330 ft n line, 330 ft w line, blk 2, of s½ of SK&K sur 63, abnd 2532 ft.

NOTES FOR THE Equipment Buyer and User

Air Compressor

CHICAGO PNEUMATIC TOOL COMPANY

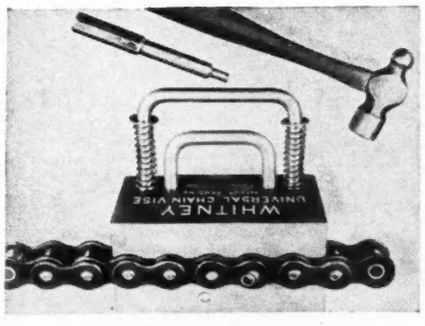
A new Diesel-driven two-stage air compressor has been developed by Chicago Pneumatic Tool Company, 6 E. 44th Street, New York. This Class W-CO unit consists of a double-acting water-cooled compressor on a common crankshaft and base with a heavy-duty Diesel engine. Standard sizes of compressors are available in capacities of 662 to 2000 cubic feet per minute for pressures of 80 to 125 pounds.

The makers point to the economy of operation, illustrated by tests which show that operation of the smaller compressors for 42 cents per hour is possible. Simplicity of design is the keynote of the engine construction; all bearings are easily accesible, and each connecting rod has a separate crank pin. In full description of the new unit, the makers have prepared Bulletin 767, which is sent on request.

Chain Vise

WHITNEY CHAIN & MANUFACTURING COMPANY

A universal chain vise has been developed by Whitney Chain & Manufacturing Company, Hartford, Connecticut, to simplify the installation and repair of cottered or riveted type roller



Whitney Chain Vise

chain in pitches from ⅝" to 2½". The vise is opened with one hand and the chain placed into the jaws. When released the spring tension clamps the chain into position and leaves the workman with both hands free for the disassembly operation. With this tool it is also possible to repair a chain without removing it from the sprockets, using the vise block as an anvil.

Drawing Instruments

KEUFFEL & ESSER COMPANY .

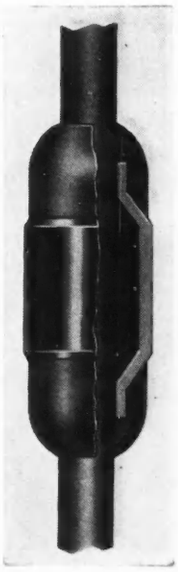
American-made drawing instruments, developed for "straight line" production, are now in manufacture at the Hoboken, N. J., plant of Keuffel & Esser Co.

The new instruments are called "Minusa", a name made by contracting "Made in U. S. A."

Except for the hand-fitting operations, "Minusa" instruments are made by modern machine production methods throughout—a new technique that is said to represent a distinct engineering achievement. For over a century most of the drawing instruments used in America have been imported from Europe, where they are still virtually made by hand. Previous attempts to transplant the industry have followed European methods closely, producing excellent instruments, but at costs far higher than those of European manufacture, even after duties and freight have been considered.

Sucker-Rod Protector

THE DIA-LOY COMPANY



Protector

The Dia-Loy Company, 101 North Alameda Avenue, Burbank, California, announces a sucker-rod protector which consists of a ring of special alloy. The ring is split into two halves which are applied to the rod in any desired location and are held in place securely by babbitting to the rod. As many protectors as are necessary may be used.

In addition to preventing rod wear and subsequent parting, the maker claims, the protector serves as a stabilizer to reduce vibration and resulting crystallization in the rod. On fully equipped rod strings, the highly polished bearing surface of Dia-Loy not only gives protection to the tubing and rods but greatly reduces the friction load which means a large saving in power and far less rod breakage. Cuttings, caused by wear of tubing, rods and couplings which fall into the pump, can be practically eliminated.

Portable Pipe Threader

BEAVER PIPE TOOLS

A carriage-mounted rack and pinion-feed motor-driven pipe and bolt threading and cutting machine has been introduced by Beaver Pipe Tools, Warren, Ohio. This Model B unit is equipped with 110 or 220 volt AC or DC 1.6 horsepower motor. The unit is mounted on a 36 x 18 inch base for which pipe leg pedestal is available. No hand tools

GET THE WHOLE STORY

about the self-locking nuts that are revolutionizing fastening practices in the oil fields . . .

THIS BOOK is more than a catalog. Besides showing the many types and sizes of Elastic Stop Nuts available, it explains the Elastic Stop principle, gives comparative test data, shows methods of application, and illustrates uses in the petroleum and related industries.

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AMERICAN WELL AND PROSPECTING COMPANY
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MURRAY RUBBER
VALVE INSERTS

Here's another leading manufacturer of Rotary Drilling Machinery who has standardized on Murray Mechanical Rubber Goods, not only for slush pump valve inserts, but for numerous other parts requiring highest quality resilient material.

Our modern facilities and strict supervision of all work enable us to give the highest quality and efficient service on mechanical rubber goods and synthetic oil-resisting products.

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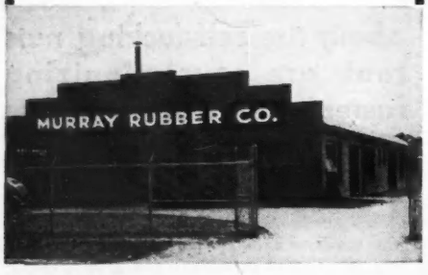

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NEW ORLEANS

"like walking into your own home" that's what people say about Hotel Chalmette just a few blocks from historic Canal Street and close to every feature of interest in New Orleans.

ROOMS WITH BATH
Single $1.75 Double $2.75

HOTEL CHALMETTE

NOTES FOR THE Equipment Buyer and User

are required in its operation; a 3-jawed universal gear chuck accommodating cutting tools and threading dies capable of handling ⅛-inch to 2-inch stock. All gears are fully encased and lubricated.

Dulin Elected President of Petroleum Equipment Suppliers

E. S. Dulin, president of Byron-Jackson Company, Los Angeles, was elected president of the Petroleum Equipment Suppliers Association at a meeting of the membership held in conjunction with the annual American Petroleum Institute meeting at Chicago last week. He succeeds J. L. Shakely, of Tulsa, president of Frick-Reid Supply Corporation.

The new vice president of the organization is E. W. Gildart, Norvell-Wilder Supply Company, Beaumont, Texas. Wharton Weems of Houston was re-elected executive secretary and counsel.

The following directors were elected:

Pacific District

F. C. Merritt, E. S. Dulin, D. S. Faulkner, L. H. Keim, J. A. Crawford, Roy Sommers, J. C. Axelson, H. H. Glenn, Mark Brown, Ted Sutter, Harold Howard and L. N. Slater.

Eastern District

Percy C. Jones, J. A. Geismar, Frederick F. Murray, Donald Mackie, Jerry McJunkin, George Alten, Sam Gregg, Casper Ruf, Ferd J. Spang, and William Patterson.

Mid-Continent and Rocky Mountain District

J. L. Shakely, W. M. Bovaird, Earl W. Miller, A. A. Moody, D. R. Brown, J. R. Brooks, Guy Thompson, Frank Hinderliter, and John Larkin.

Southwestern District

W. L. Childs, W. J. Morris, John T. Crotty, E. W. Gildart, Gordon Richmond, E. M. Smith, Wallace Wilson, Ed Lorehn, Allen Guiberson, John Tear, W. B. Sharp, and J. N. Kinnebrew.

Buda Engine representative going to South America

George Koons, foreign representative for Buda Engine Company, and John Neukam, sales promotion department at the Buda main offices in Harvey,

Left to right: Wharton Weems of Houston, executive secretary and counsel; E. W. Gildart, Norvell-Wilder Supply Company, Beaumont, vice president; and E. S. Dulin, Byron Jackson Company, Los Angeles, president.

NOTES FOR THE Equipment Buyer and User

Illinois, spent a part of the week with representatives of Buda Engine Sales and Service Company of Tulsa, distributors in Kansas, Oklahoma and Illinois. They were accompanied by J. C. Baseheart, Fort Worth, Mid-Continent manager for Buda Engine Company. Koons is preparing to leave on an extended trip through the oil fields of South America after having spent the past two years covering the principal oil fields of Europe.

O'Neill to head American-La France-Foamite

Edward E. O'Neill has become president of American-La France-Foamite Corporation of Elmira, N. Y., by recent action of the board of directors in selecting a successor to the late W. J. Childs. O'Neill has been vice president and director of the fire control equipment company since 1936 and has had 24 years of experience in that line. William M. Cooper was appointed vice president, director, and comptroller. For the past four years Cooper was associated with Stevenson, Jordan & Harrison, management engineers.

De La Mater New Chief Engineer for Parkersburg

R. Griffin De La Mater has been appointed Chief Engineer of Parkersburg Rig & Reel Company, succeeding Wm. Schwemlein, who was transferred to executive duties. De La Mater graduated from Rensselaer Polytechnic

R. GRIFFIN DE LA MATER

Institute in 1921 and thereafter served as assistant professor of mechanical engineering at Worchester Polytechnic Institute. Later he engaged in consulting work, and in 1929 joined Parkersburg as assistant chief engineer.

Bronze Gate Valves

THE FAIRBANKS COMPANY

A new line of bronze gate valves has been developed by The Fairbanks Company, Binghampton, New York. Available with either rising or non-rising stems, these valves are furnished in pipe sizes from ¼-inch to 3 inches, and they feature malleable iron hand wheels, an extra or "follower" gland on the stem, an extra-deep stuffing box, and accurately machined top seats, that allow the valves to be repacked under full pressure.

Makers assert that special attention has been directed toward reinforcing and hardening all parts placed under physical or corrosive stress. The valves are made to close tolerances in all parts to assure a perfect seal.

MacPherran Retires, Harold Stein's Duties Enlarged

Ralph S. MacPherran, chief chemist of Allis-Chalmers Manufacturing Company for many years, is retiring from active service. Harold J. Stein, Research Engineer of the manufacturing department has been appointed director of research, chemistry and metallurgy, bringing all these activities under one head. His assistant will be J. T. Jarman.

Mr. MacPherran is especially noted as an outstanding metallurgist in the field of gray iron and has long been active in many technical societies connected with his profession. In 1931 he was selected to receive the coveted J. H. Whiting gold medal award of the American Foundrymen's Association. Aside from several years with Illinois Steel Company right after graduating in chemistry at the University of Michigan, he has been with Allis-Chalmers since 1895.

Stein came to Allis-Chalmers as a graduate student apprentice in 1916 and

REED'S 'B-R' DRILLING BIT WITH WIRE LINE RETRACTABLE CORE BARREL

HARD FORMATION HEAD (Interchangeable with Soft Formation Head)

REED 'B-R' Drill Collar and 3-Blade Drilling Bit with Core Barrel in position

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YOUR OWN ELECTRICITY WHEN YOU WANT IT

Here's electricity for the light and power you need at the amazingly low cost of only ONE CENT a kilowatt. The WITTE Dieselectric is always ready to serve you wherever you set yur rig. And you pay for only the current you use. Operates on cheap, non-explosive fuel. Reduces fire hazard.

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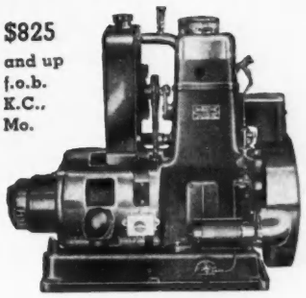
1500 to 30,000 Watts

$825 and up f.o.b. K.C., Mo.



FINGER-TIP CONTROL . . . Remote or at Engine

Just push a button, the WITTE does the rest. Practically any employee can operate it. Requires no attention. Compact and easily moved from job to job. Before you buy any Diesel investigate the WITTE.

SEE YOUR SUPPLY DEALER or write for complete information. Horizontal and Vertical. Manual, electric starting or completely automatic.

WITTE ENGINE WORKS

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during his period of training served in the various manufacturing departments including detail, erection and test. Working in the forging department he was later made foreman of the tractor heat treating department and then general foreman of all the company's heat treating operations. He was next advanced to assistant superintendent of the forge department and later to assistant research engineer of the manufacturing department. In 1936 he was made chief research engineer.

Gas-Lift Intermitter
THE S. M. JONES COMPANY

The S. M. Jones Company, Toledo, Ohio and Tulsa, Oklahoma, announces purchase of exclusive manufacturing and sales rights of the H. M. Staggs patents for a surface-controlled gas-lift intermitter which will be marketed under the name of the "Jones-Staggs Intermitter."

An announcement pointed that this new interest is in line with the company's established policy of confining its activities to specialization in artificial oil lifting problems. Some time ago this interest and appreciation of production problems led to the study of various types of devices accomplishing this purpose and experimental gas-lift intermitters were manufactured by the company and tried as early as 1935.

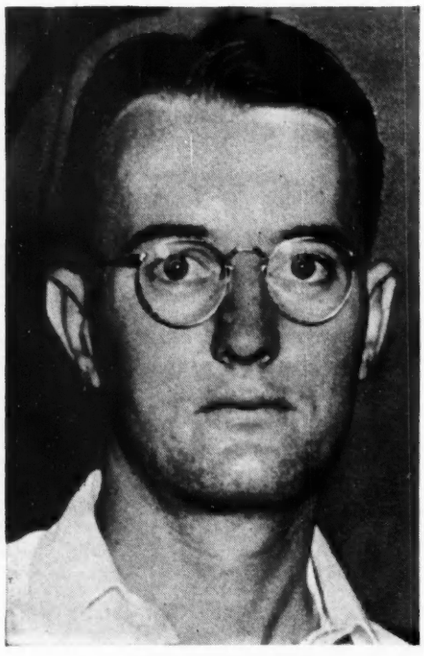
The Jones-Staggs Intermitter, it was said, is a proved and developed product with numerous installations under a variety of operating conditions in different fields; having now been in service some time. These installations have proved the soundness of this method of production effecting extremely low gas/oil ratios under procedures easily adapted to current oil field practices.

Standco
NO-SMOKE
STANDCO BRAKE LINING
Is the driller's best friend because it makes the easiest brake known and "feeds off" evenly while drilling. It never scores brake rims. See Page 2100 Composite Catalog.
Standco Brake Lining Co.
HOUSTON

NOTES FOR THE Equipment Buyer and User

Texas Electric Steel Gives Ferguson Engineering Post

Texas Electric Steel Casting Company, Houston, announces the appointment of Bill Ferguson to the sales engineering department. Ferguson was graduated in 1936 as a chemical engineer from Rice Institute. After two years of consulting work, he joined the Tesco organization for service in the company's chemical laboratory.



BILL FERGUSON

Chain Belt Company Makes E. J. Greene Assistant Treasurer

Chain Belt Company of Milwaukee announces election of Edward J. Greene as an assistant treasurer of the company.

Greene formerly was assistant treasurer and purchasing agent of Baldwin-Duckworth Chain Corporation, which was recently merged with Chain Belt Company. He is a member of the National Association of Cost Accountants and the Purchasing Agents' Association.

Bethlehem-International Opens Grayville Store

Bethlehem-International Supply Company announces the opening of a new oil field supply store at Grayville, Illinois, with M. L. Creed as store manager and C. T. Cox, field salesman. John Ihrig is district manager of the Illinois area with headquarters at Salem, Illinois.

Collyer of B. F. Goodrich Arrives to Assume Duties

John L. Collyer, formerly joint managing director of Dunlop Rubber Company, Limited, upon arrival from England to assume new duties as president of B. F. Goodrich Company, asserted that he expected no halt in rubber importations because of the war, and stressed the importance of freedom from foreign entanglements.

Bovaird Supply Company has third Illinois store

The Bovaird Supply Company, Tulsa, Oklahoma, has announced the opening of a new store in Grayville, Illinois, with D. W. (Don) Cunningham as manager. Cunningham was field salesman at the company's Salem, Illinois, branch before the move. At Grayville will be kept a complete stock of tubular goods, and drilling and pumping equipment suitable for that territory. Cunningham will be assisted by adequate, trained personnel.

D. W. CUNNINGHAM
Bovaird Supply Co.

SAFE TESTED ECONOMICAL PRESSURE AND VOLUME CONTROL
UP PROFITS
Adds surface controlled rate of withdrawal to the advantages of bottom hole choking. Eliminates freezing at the surface controls without expensive surface heaters.
CALL OR WRITE
OTIS PRESSURE CONTROL, INC.
DALLAS, TEXAS
Branches: Houston, Texas; Hobbs, N. M.; Oklahoma City, Okla.
with OTIS REMOVABLE BOTTOM HOLE REGULATOR

Squeaks from the Bull Wheel

Joint Complaint

"I am going to see the doctor about my wife. I don't like the way she looks."

"I'll go along with you. I don't like the looks of mine either."

Not Grace

"Listen, Chief, I won't be able to motor back until Thursday."

"So you want a few more days of grace, eh?"

"No, sir—of Helen."

Trees

I think that I shall never see along the road an unscraped tree, with bark intact, and painted white, that no car ever hit at night. For every tree that's near the road has caused some auto to be towed.

Sideswiping trees is done a lot by drivers who are plumb half shot. God gave them eyes so they might see, yet any fool can hit a tree.

Good In The Fall

"Darn it! Everybody puts their nose in my business."

"Can't you do something!"

"Why should I? I manufacture handkerchiefs."

Reasonably Safe

You haven't said a word for twenty minutes.

Well, I don't have anything to say.

Don't you ever say anything when you have nothing to say?

No.

Well, then, will you be my wife?

Protection

When the negro cook returned to work Monday morning, the housewife observed her taking an ice pick out of her bosom and throwing it into the cedar ice bucket.

"Liza," she asked, "what have you been doing with our ice pick?"

"Land sakes alive, Missy, don't you know no colored gal what is a lady would go to town Sattidy night without a ice pick?"

Easy

"Did you find it difficult to find a name for your little son?"

"No! Certainly not. We have only one masculine relative who has a fortune!"

Heroes!

The school teacher was coaching her class of little boys on what to do in case of air raids.

"Now let us make believe," she stated, "that we hear the sirens warning us that planes are coming—whoooooooo!"

As she imitated a siren all but one lad dived under his desk for protection.

"Sammy!" almost shouted the teacher. "Why are you sitting there with your chin cupped in your hands so indifferently? Run for your life! Don't you know that this is war?"

Returned Sammy: "And don't you know that there are heroes?"

One Was Enough

Mom, teacher asked us about our families today, and whether we had any brothers and sisters.

That was nice of her. What did she say about your family?

I said I was an only child.

What did teacher say then?

She sighed, and I heard her say, "Thank Heaven" under her breath.

Seasonal

Did you know you had a pug nose?

Yeah, but I can't help it.

Do pug noses run in your family?

Only in cold weather.

Well Drilled

"Our infantry company was the best drilled in the whole army. When we presented arms all you could hear was 'slap, slap, click'."

"Good? When our company was on parade and presented arms all you could hear was 'slap, slap, jingle'."

"That's impossible. How did you get the jingles?"

"Oh, medals."

They'll Learn

It took me 12 lessons to teach Sylvia to swim.

Why, the little flirt; I taught her in six.

Couldn't Do Better

Friend: "But isn't your son sort of listless?"

Mr. Moneybags: "Heavens, no; he has a list of blondes, a list of brunettes, and a list of redheads."

Behold the Fisherman

He riseth up early in the morning
And disturbeth the whole household
Mighty are his preparations.
He goeth forth full of hope and
when the day is far spent he returneth
Smelling of strong drink
And the truth is not in him.

Modern Wife

"Darling, I've bought you a simply marvelous washing machine. You just press a button and the work's done."

"Um-hum—and who's going to press the button?"

Not Particular

"Say, Dad, have you any work you'd like me to do?"

"Why—no—but—er—."

"Then how about putting me on relief?"

Learning—Not Yearning—Wanted

"Look at that. I thought I told you to engage a new stenographer on the basis of her grammar."

"Grammar? I thought you said glamour."

"Wat's up, Bill, 'urt yerself?"

"No, gotta nail in me boot."

"Wy doncher take it out then?"

"Wot! In me dinner hour?"

The reliable cure for pipe-line troubles . . .

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The rugged construction of Devlin Fittings, plus their extreme accuracy of tapping and threading . . . all double-checked through rigid control and inspection . . . explains why they give such completely satisfactory service on oil pipe lines. It pays to demand

DEVLIN HEAVY OIL MALLEABLES

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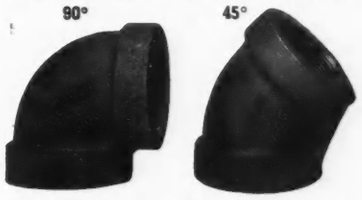

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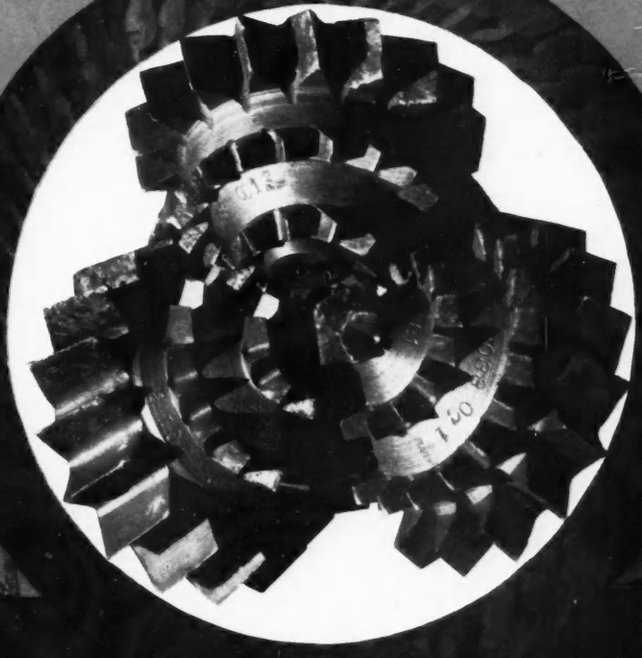

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ROTARY
WALL SCRAPER

The Baker Rotary Wall Scraper provides a safe, efficient means of enlarging the walls of an open hole to a diameter considerably greater than the casing or hole through which tool is run.

REMARKABLE REAMING CAPACITY

One of the outstanding features of the Baker Rotary Wall Scraper is its remarkable reaming capacity in relation to the O. D. of the tool. It has a maximum expansion on the Cutter Blades ranging from 4" to 36".

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The safety of this tool has been ably demonstrated in the thousands of successful runs made in oil fields throughout the world under most adverse operating conditions.

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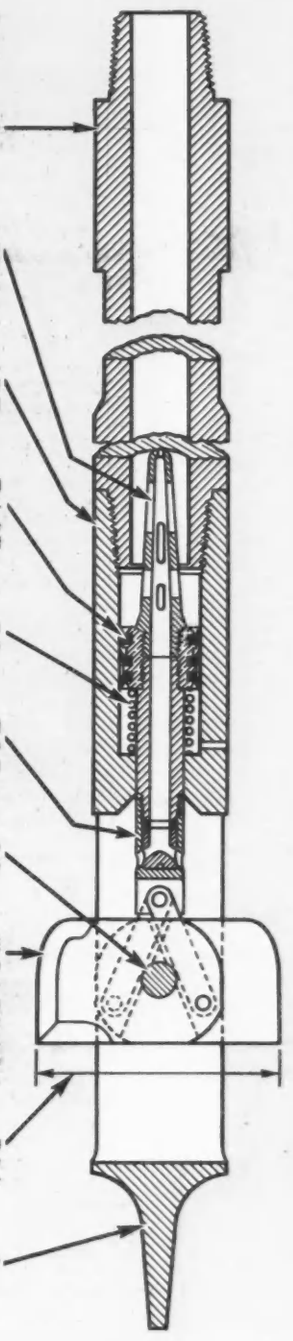
Here are the Construction Features which make the Baker Wall Scraper a Sturdy, Dependable Tool:



(1) ***Double Pin Drill Collar***—Connects Wall Scraper Body to drill collar.

(2) ***Circulation Screen***—Design of cone-shaped Screen minimizes abrasive action of fluid and prevents debris from clogging circulation passages.

(3) ***Wall Scraper Body***—Machined out of a solid piece of SAE 3140 Chrome-Nickel steel . . . provides great strength.

(4) ***Plunger Head***—Provided with oil resistant Seals to prevent fluid by-pass and insure Piston efficiency . . . Blades will Positively Open.

(5) ***Plunger Spring***—Strong Plunger Spring insures blades properly closing.

(6) ***Bushing (Circulation Bean)***—Fluid is directed on each blade, lubricating and cooling cutting surfaces.

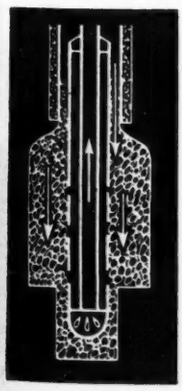
(7) ***Hinge Pin***—Machined from solid piece of SAE 6145 Chrome-Vanadium steel.

(8) ***Blades***—Machined from SAE 4145 Chrome-Molybdenum steel forgings . . . afford toughness and hardness. Cutting edges are hard-faced and set with Tungsten Carbide inserts. Long-bearing surface on blades minimizes "corkscrewing."

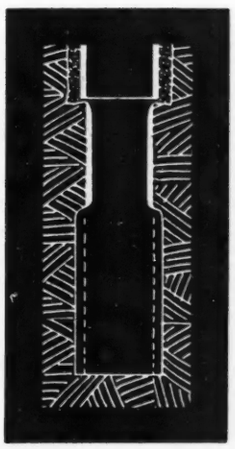
(9) ***Blade Expansion***—Amazing reaming capacity provided by expansion range of Cutter Blades from 4" to 36".

(10) ***Pilot Bit***—Centers Scraper and steadies cutting action.

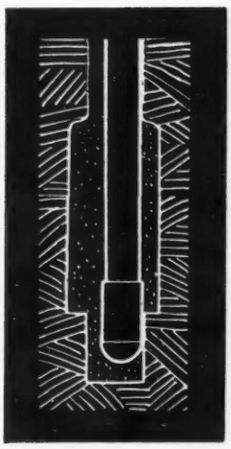
A FEW IMPORTANT WALL SCRAPER APPLICATIONS



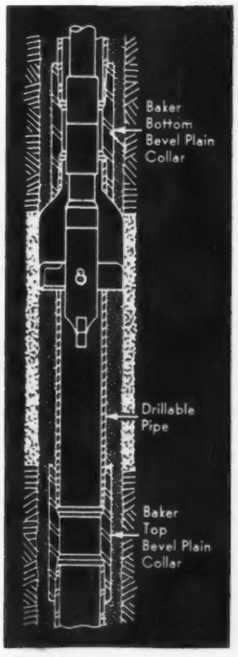
A typical Gravel Packing job, showing hole enlargement performed with Baker Wall Scraper.



Showing application of the Baker Wall Scraper for removing the mud sheath from the face of the formation.



A bottlenecking job done with a Baker Wall Scraper.



Cutting out sections of drillable pipe with Wall Scraper.

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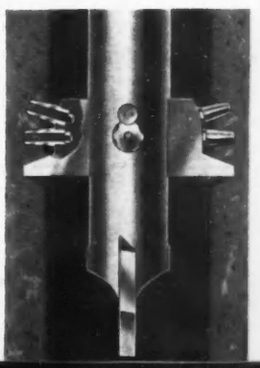
This device is really "two tools in one" since by merely substituting Sampler Blades for the regular Scraper Blades, the tool is converted into a Baker Rotary Wall Sampler—an exclusive Baker feature. With this device it is possible to take actual cores from the side walls of any uncased hole at any depth.



Showing Wall Sampler Blades taking cores from side walls.

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By S. F. SHAW, E.M., Consulting Engineer

Gas-Lift Principles and Practices is based on a series of lectures given at the Agricultural and Mechanical College of Texas on November 9 and 10, 1939, by the author as special lecturer of the Department of Petroleum Engineering.

Much of the material used in the lectures is included in this book. There are also included chapters on compressor plants and data on gas-lift operations in various fields in the United States and foreign countries.

Gas-Lift is an art, subject to rigid physical laws which are but vaguely understood, owing to the difficulty in observing all of the conditions that are operative during the time that the gas-lift is performing. The apparent simplicity of the mechanical operation of the gas-lift is misleading, and yet a close study is very important to insure the most efficient results.

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LOOKING AHEAD

WITH THE EDITOR

Outlook Brighter for Paleozoic Oil in Western Europe

THERE is a broad belt extending from England across Belgium and the Netherlands into Germany with geological features similar in many respects to those of the Appalachian region of the United States in which several important oil fields are located. Disregarding a heavier overburden in the European region, that similarity will continue to cause exploratory drilling until definite conclusions have been reached.

Discussion of this large potentially important belt will be published in an early issue of THE OIL WEEKLY under the title "Late Prospecting Brightens Outlook for Paleozoic Oil in Western Europe," by W. A. J. M. Van Waterschoot Van Der Gracht.

THOSE of you who read Part 1 of "Range and Application of Gas-Lift Methods" in this issue will be glad to know that Part 2 of Babson's study will be published soon.

In the second installment of the series he treats the subject of gas lift through 3-inch tubing and between 6⅝-inch casing and 2½-inch tubing. The text is accompanied by 16 illustrative graphs.

Conclusions reached in Babson's paper are those drawn from the research of the American Petroleum Institute's Production Practice Committee on gas lift.

The OIL WEEKLY, Published every Monday. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.